

LISRC#382
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People and the Sound

LAND USE

A Planning Report prepared for the New England River
Basins Commission by Ralph M. Field and Associates for the
U.S. Department of Housing and Urban Development



The Long Island Sound Regional Study is a "level B water and related land resources study." It was conducted under provisions of the federal Water Resources Planning Act of 1965. The Plan which has been developed was prepared by a team of federal, state, and regional officials, local citizens, and the scientific community, under the overall coordination of the New England River Basins Commission. It is a part of the Commission's comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

The plan for Long Island Sound recommends a program for action by federal, state, and local governments; it does not bind them to undertake specific recommended actions. To assist in the evaluation and implementation process, the following reports have been prepared:

A PLAN FOR LONG ISLAND SOUND: A SUMMARY. Highlights of the plan and a brief discussion of the rationale leading to recommendations.

A PLAN FOR LONG ISLAND SOUND: SUPPLEMENT. A more comprehensive planning document which enumerates the major alternatives considered in formulating the recommendations, together with an explanation of how the plan was prepared, who did the work, and background information organized both by subject matter and by geographical sub-regions of the Study Area.

PLANNING REPORTS. Each planning report was developed by a "Work Group," chaired by a federal agency, with the active participation of state and local agencies, other federal agencies and citizen and scientific advisors. These reports incorporate data (originally published in a series of Interim Reports) which estimate people's demands for the resources of the Sound region, the requirements needed to meet those demands, the existing capacity of the region to meet the requirements, and any deficiencies noted.

The second half of each planning report develops solutions by stating objectives in terms of satisfying defined needs, suggesting alternative ways to achieve the objective, evaluating each alternative in terms of environmental, economic, and social criteria, developing economic, environmental, and composite plans, and finally making recommendations.

The following Planning Reports were prepared:

Water Management by the U. S. Environmental Protection Agency, and the States of New York and Connecticut.

Land Use by Ralph M. Field and Associates for the U. S. Department of Housing and Urban Development.

Outdoor Recreation by the U. S. Department of the Interior, Bureau of Outdoor Recreation.

Fish and Wildlife by the U. S. Department of the Interior, Fish and Wildlife Service; and the U. S. Department of Commerce, National Marine Fisheries Service.

Shoreline Appearance and Design by the U. S. Department of the Interior, National Park Service and Roy Mann and Associates.

Marine Transportation by the U. S. Department of the Army, Corps of Engineers.

Power and the Environment by Federal Power Commission staff.

Mineral Resources and Mining by the U. S. Department of the Interior, Bureau of Mines.

Flood Damage Reduction by the U. S. Department of the Army, Corps of Engineers; and the U. S. Department of Agriculture, Soil Conservation Service.

Erosion and Sedimentation by the U. S. Department of the Army, Corps of Engineers; and the U. S. Department of Agriculture, Soil Conservation Service.

OTHER REPORTS published in conjunction with the Study are:

An Economic Perspective by the U. S. Department of Agriculture, Economic Research Service; and the U. S. Department of Commerce, Bureau of Economic Analysis. An examination of the economic and demographic trends in the region, with data for use as the basis of all projections made in the Study.

Shoreline Appearance and Design: A Planning Handbook by Roy Mann Associates, Inc., for the U. S. Department of the Interior, National Park Service. Recommended management procedures for protecting and enhancing the region's scenic resources.

Sources and Movement of Water by the U. S. Geological Survey, Water Resources Division; and the National Oceanic and Atmospheric Administration. A summary of the hydrology and climate of the region.

Soils by the U. S. Department of Agriculture, Soil Conservation Service. An inventory and analysis of soil composition in the region.

For a complete listing of reports published by or in conjunction with the Study, see Appendix A of the Supplement. Copies of these reports are available from:

New England River Basins Commission
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Boston, Mass. 02108

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LONG ISLAND SOUND REGIONAL STUDY
LAND MANAGEMENT
 A POLICY GUIDE TO LAND USE

submitted to the New England River Basins Commission by
The US Department of Housing & Urban Development
 REGION 1 BOSTON, MASSACHUSETTS

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FOREWORD

LONG ISLAND SOUND is one of the nation's unique and irreplaceable natural resources. An almost fully enclosed arm of the ocean, it has over 1300 square miles of water surface and over 600 miles of coastline. Spreading eastward along both shores from the great metropolitan center which lies at the Sound's western end, a growing concentration of increasingly affluent people make ever greater demands on this urban sea. At the same time, there is a growing feeling that the conflicting demands are destroying the Sound, and that the problems must be resolved if the Sound is to be preserved.

THE LONG ISLAND SOUND REGIONAL STUDY is a comprehensive planning effort by the Federal government and New York and Connecticut, led by the New England River Basins Commission. Assisting the Commission are professionals from many disciplines representing the Federal, state and regional agencies listed on the back cover, a Citizen Advisory Committee, and a Research/Planning Advisory Committee composed of members of the region's scientific community.

THE GOAL OF THE STUDY IS TO PRODUCE A PLAN OF ACTION BY THE SPRING OF 1975 WHICH BALANCES THE NEEDS TO PROTECT, CONSERVE AND WISELY DEVELOP THE SOUND AND ITS RELATED SHORELANDS AS A MAJOR ECONOMIC AND LIFE-ENRICHING RESOURCE FOR THE 12 MILLION PEOPLE WHO LIVE NEAR IT.

THIS PLANNING REPORT IS ONE OF A SERIES. The first half of each report is problem-oriented. It summarizes demands placed upon the Sound and adjacent lands, their capacity to supply these demands, and present or expected needs to be met, if it is determined that supply should meet demand. The last half of each report is solution-oriented. It formulates tentative objectives and alternative measures for achieving the objectives. It evaluates the environmental, economic and social implications of each measure and formulates alternative plans. One plan is tentatively recommended. The planning reports are printed and distributed before the final version of main report. Therefore, final recommendations are to be found only in the main report, scheduled for publication in the Spring of 1975. Planning reports in this series include:

Land Use
Water Management
Shoreline Appearance & Design
Erosion and Sedimentation
Flood Damage Reduction

Recreation
Fish and Wildlife
Marine Transportation
Minerals
Power and the Environment

PREFACE

In 1971, the U.S. Water Resources Council directed the New England River Basins Commission to study the future of Long Island Sound and to recommend goals and actions. To aid it in conducting the study, the Commission convened 13 technical work groups. Each was composed of professionals from federal, regional and state agencies, as well as members of a Citizen Advisory Committee and a Research/Planning Advisory Committee. Each group dealt with a particular problem area such as land use, water quality, scenic and cultural resources, or transportation. Each has issued an inventory report, describing present conditions and problems, and a plan report, looking to the future. This is the plan report of the Land Use Work Group.

Unlike the other work groups, the Land Use Work Group was not charged with solution of a functional problem such as the reduction of flood damage or the provision of electric power. Its task, rather, was to furnish an areawide overview to supplement the several functional perspectives provided by the other groups. In preparing this overview, the Work Group has kept the following principal issues in mind:

How are current development trends likely to affect the use of land in the study region? In considering this issue, the Group has paid particular attention to the demands that anticipated urbanization will place on limited land supply.

Should public policy seek to modify these trends?

If so, what land use policies and measures should be considered to effect the desired modifications?

In considering future land-use policies, the Work Group has borne in mind that this is a region-wide, Sound-oriented study. Emphasis has been placed on policies requiring basinwide action oriented toward water and related land resources, with primary attention to areas bordering the Sound itself. The Group has avoided the comprehensive and detailed land use planning that falls within the province or regional, country, and local planning agencies.

It is impractical to mention all the people who have contributed their time, skill, and knowledge to the preparation of this report. The following, however, require special mention:

The members of the Land Use Work Group: Dr. Edith G. Tanenbaum, of the Nassau-Suffolk Regional Planning Board; Hall Winslow of the Tri-State Regional Planning Commission; Carol Sondheimer of the New York State Office of Planning Services; Richard N. Symonds, Jr., of the Connecticut Office of State Planning; Elmer Offerman of the U.S. Soil Conservation Service, Walter J. Morrill and Kenneth J. Johnson of the U.S. Forest Service.

The special assistance of all the following is gratefully acknowledged: Dr. Rita D. Kaunitz of the Research/Planning Advisory Committee; the members of the Citizen Advisory Committee, particularly John Hibbard, Claire Stern and Barbara Deitrick.

David Prescott, Environmental and Standards Officer of HUD, Region 1 provided continual policy guidance and direction throughout the course of the project.

The directors and staff members of the county and regional planning agencies within the Long Island Sound Study area, and the project staff of the New England River Basins Commission were generous in their review of technical materials and most helpful in their suggestions for report revision and content modification.

Staff and Consultants of Ralph M. Field and Associates coordinated the activities of the Work Group and prepared the final report. Jim Wharton and Ann Yahner bore the principal staff responsibilities. Jack Noble participated in several phases of the work and provided valuable comments, as did Henry Goldstein who also edited the report.

Ralph M. Field, Chairman, Land Use Work Group,
and Consultant to the U.S. Department of Housing
and Urban Development
February 17, 1975

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HIGHLIGHTS: ISSUES & POLICIES

GROWTH

REGIONAL CONTEXT . . . Anticipated growth of metropolitan New York makes population growth in the Sound area inevitable. All but 12 percent of the population of the Sound area is in the New York Metropolitan Region. Most future population growth within the Sound area will be a function of regional growth.

Recognition that large-scale population growth will occur is more important than prediction of its exact amount. Population projections, nevertheless are useful indicators of likely change.

Metropolitan Growth

Though recently reduced in response to the declining national birth rate, population projections for metropolitan New York anticipate that a 1970 regional population of almost 20 million will rise to about 25 million by 2000 and level off thereafter at about 28 million.

Regional Growth

The Sound area's share of the larger metropolitan New York population is expected to remain virtually constant through the coming decades, increasing slightly from 12 percent in 1970 to about 12.3 percent in 2000. Or, to state expectations another way, the population of the Sound area is expected to rise from 2.25 million in 1970, to more than 3 million in 2000, and to nearly 3.5 million in 2020, a 54 percent increase between 1970 and 2020. As Map 2 shows, the principal growth is likely to occur in the Connecticut and Suffolk County portions of the study area.

Urban Land Consumption

In the absence of major unforeseen changes in lifestyle preferences, energy supplies, and communication or transportation services, development densities are likely to remain low. Urban land consumption will be correspondingly high. Recent development of open land in the Sound area has been averaging 2,500 persons per square mile of development. By contrast, towns containing center cities have densities averaging 7,000 persons for each square mile of developed area. The average for the Sound area as a whole in old as well as new developments is about 3,500 persons for each square mile of developed area. Because of the strong trend toward dispersal, future development is not expected to increase this average.

LOCATION OF URBAN LAND CONSUMPTION

. . . Given the anticipated population growth of outlying areas and the relatively low anticipated densities, substantial amounts of land in outlying areas are likely to become urbanized. Map 6 suggests the amounts of land that would be needed for urban development if the additional projected population were to occupy land that is presently open. To give a more specific sense of possible urban areas, Map 9 shows where planning agencies expect sewer service to be provided by 1990 and 2020.

POLICY

Guided Growth: In the absence of national and regional growth policies and of institutions to

implement them, governments in the Sound area should respond to growth pressures by seeking guided growth rather than no growth.

- If the nation or the New York region is viewed as a whole, population growth appears inevitable.
- It is conceivable, though by no means clear, that a national or regional growth policy would direct a smaller (or larger) proportion of anticipated population growth into the Sound area.
- At present, however, there is no explicit national or regional policy on population distribution, nor is there any national or regional consensus out of which such a policy seems likely to arise in the near future.
- In the absence of a national or regional policy, local and state governments that resist population growth or economic development can only give negative responses to growth problems ("no growth in this community") without providing the affirmative responses ("growth in that community instead") that must be given if growth problems are to be solved rather than merely avoided.
- Some governments, responding to the wishes of their residents, may nevertheless resist growth, and the resulting growth restrictions sometimes may prove effective. Clearly, however, the curbs face formidable legal, administrative, and political obstacles. Moreover, if restrictions become so widespread that they create unacceptable obstacles to accommodation of national or regional growth pressures, overriding action by higher levels of government seem almost sure to ensue. Long-range local opportunity to limit population growth thus appears limited.
- By contrast, measures that seek to influence the character and location of growth, to minimize its interference with the quality of life and thereby remove some of the basis for citizens' no-growth demands, hold considerable promise of effectiveness.
- All governments within the Sound area, therefore, should seize the opportunity to guide growth, to influence its character and location and to protect natural resources, amenities, and the quality of life within their jurisdictions.

OPEN SPACE

OPEN LAND . . . Contrary to popular impressions, there is a great deal of open land within the Sound area. As Map 6 shows, about 68 percent of the total land area is open, and only about 32 percent developed in urban use.

Much of the open land makes its greatest contribution to the public good in its present natural, agricultural, or other open condition. Such open space areas are shown on Map 5. They include:

- Lands especially influenced by water: wetlands, streambelts, flood plains, water supply areas, waterfronts.
- Lands of special soil capability and resource values: prime agricultural and forest lands.

Past urban development in the Sound area has often encroached on these open lands without regard for their special potential.

In the future, some further encroachment is unavoidable, if only because some of these high-contribution open spaces are located near transportation and other public services where they can make an even greater contribution as urban development sites.

Government actions can reduce needless encroachment, however, by (a) establishing protection for special open space areas, and by (b) encouraging moderate and high-density development in appropriate locations to reduce the amount of land needed for urban development as a result of both population growth and redistribution.

POLICIES

1. Protect open space

High-contribution open spaces, such as wetlands, streambelts, floodplains, watershed areas, prime agricultural and forest lands, should remain open except where urban development cannot be diverted practicably to other lands. Insofar as it is practical, state and local governments in the Sound area should follow these implementing policies:

- a. High-contribution open spaces should be officially designated now. Precise mapping of

their boundaries should follow as rapidly as possible.

- b. Within designated open spaces, regulations should prohibit all urban development except that which is shown to be unavoidable. To determine whether development is unavoidable, official plans or environmental impact statements should evaluate all alternative sites at which anticipated development demand within the regulating jurisdiction could realistically be satisfied. Development of a designated open space site should be considered unavoidable only if this evaluation shows that anticipated demand cannot reasonably be satisfied by feasible development (or redevelopment) of undesignated sites and of designated sites whose development would be less harmful to the public interest.
- c. To protect designated open spaces, at the least cost to the public, governments should make maximum feasible use of regulations, limited only by constitutional guarantees protecting private property rights.
- d. Regulations should encourage (and when appropriate, require) the clustering of all types of development. In addition to permitting more imaginative urban design, clustering can strengthen protective regulations by reducing the economic losses sustained by owners of protected open spaces.
- e. Governments should establish effective economic incentives to reward use of designated open spaces — including prime agricultural, recreational, and forest lands — for their best possible use.
- f. Governments should purchase open space lands, or suitable less-than-fee interests in them, if permanent optimum use cannot be adequately assured by regulations, incentives, or other acceptable measures. Prime recreation areas, whose optimum use requires access by the general public, should receive high priority for public acquisition.
- g. An overall open space program integrating prime recreation areas, high-contribution and other open spaces into a protected system should be developed cooperatively by the states and local shoreline governments.

2. Encourage moderate- and high-density urban development

Land for moderate- and high-density urban development should be designated now to encourage such development

- a. The designated areas should be located near transportation, and should provide Sound views or other especially attractive features wherever possible, so that residents of high-density areas may enjoy surroundings at least as pleasing as those they could obtain in other, lower-density sectors of the Sound area.
- b. Areas in or near the traditional centers of established communities along the Sound should be especially evaluated as likely areas for moderate- and high-density residential development. Priorities should be given to programs taking advantage of urban waterfronts for recreation and other amenities in these established centers.

3. Improve passenger transportation services

The provision of improved passenger transportation, by bus or by train, comparable in quality to that now available only by automobile in most of the Sound area, should be an essential element of any program to encourage well-located, medium- or high-density urban development. The federal government as well as other governments in the Sound area should take all practical measures including financial aid and needed railroad reorganization, to provide such improved transportation service, especially to older centers where high existing densities give more promise of supporting the improved service.

THE SHORE OF THE SOUND

DECISIONS ON SHOREFRONT USE . . . The shore of the Sound is a unique resource. However, past development decisions have often failed to respect the distinctive importance of the shorefront as a natural, cultural, and economic resource.

A few critical activities, notably ports and a few industries, require a shorefront site. While the shorefront is a uniquely attractive site for many activities, most present development bordering the Sound, including much of the industrial development, does not require a shorefront location. A sizable proportion of present residential development benefits only a few people, even though

parks or alternative uses could benefit many more. Some of the existing development is actually detrimental to the waters or to adjoining lands.

Future growth of population and cities will increase competition for use of the shoreline and will thus increase the need to assure that each part of the shoreline resource makes the greatest contribution of which it is capable.

SHOREFRONT LOCATIONS FOR WATER—RELATED INDUSTRY . . . Ports, as well as a few industries that depend on waterborne shipping or on waterfront access require a shorefront location.

Because of existing facilities, particularly transportation, shoreline configuration, and channel depth, only a few sections of the shoreline are suitable for these economically essential activities. These few sections are thus a singularly valuable land resource.

These same shoreline sections are also attractive sites for other industries, including (1) power plants and other industries that need water for cooling and, therefore, require sites near the Sound, and (2) industries that serve, or are supplied by, water-related industries and, therefore, seek locations near them.

Public action can contribute to economic well-being, both within and beyond the Sound area, by (1) reserving especially suitable shorefront sites for water-related industry and (2) ensuring that industry does not waste shorefront land.

POLICIES

1. Designate and protect shorefront industrial sites

Shorefront land suitable for water-related industry should be designated and protected now to prevent inconsistent use. Shorefront sites occupied by obsolescent factories, many of which receive little benefit from their waterfront location now that anti-pollution rules are becoming more effective, should be specially evaluated for possible inclusion in industrial land reserves located in interior areas as a means of phasing out obsolescent shore uses.

2. Use of shorefront industrial sites

Industrial sites along the shoreline, including land reserved for water-related industry, should be planned and used to obtain the greatest possible benefit from this scarce resource. Insofar as it is practical, these policies should be

followed:

- a. Shorefront land should not be used for industrial storage if any alternative site is feasible.
- b. Reserved land should be used only by industries that need shorefront sites so that they can ship by water.
- c. So that the needs of other industries may be satisfied without encroachment on the shorefront, an adequate supply of suitable sites having railroad and highway access should be reserved elsewhere. Some of these sites should be selected to satisfy the needs of power plants and other industries that need near-shore locations.

3. Maximize compatibility with nonindustrial use

Site planning and use of shorefront industrial areas should accommodate nonindustrial activities in the immediate area. Insofar as possible, commercial and industrial shoreline not used for shipping should be made available for public access and recreation, as for example combining power plants and access to the shore.

THE SHOREFRONT FOR CONSERVATION, RECREATION, AMENITY . . . The shorefront includes extensive high-contribution open spaces, including wetlands and tidal marshes.

Apart from fairly extensive natural areas that should be preserved in their present state, maximum public benefit is derived from use of shorefront of Long Island Sound for recreation and as an eye-pleasing contributor to the quality of life within and beyond the Sound region.

Many developed portions of the shorefront make a far smaller contribution to recreation and passive pleasure for far fewer people, than could be provided by the best possible patterns of use and development.

- Only about 14 percent of the shoreline is devoted to public parks and recreation areas.
- Of the publicly owned shorefront available for recreation, much is available exclusively to residents of the town or county where it is located.
- Of the privately owned shorefront, only a small proportion is devoted to commercial recreation facilities which enable the general public to enjoy the shore.

Highways have too seldom been designed to provide and protect views of the Sound, thereby further reducing public awareness and enjoyment of it. Public awareness and enjoyment of the Sound have been further reduced because highways have too seldom been designed to provide and protect Sound views.

Because so much of the shorefront is developed, and because shorefront property values are high and rising, a public program designed to make the shoreline more widely available to the general public should place primary emphasis on land acquisition. Regulations and incentives have a limited, albeit still important role to play.

There are important opportunities to acquire land for the creation of additional shorefront parks. Prime opportunities include (1) sections of some center-city slum areas, (2) "white elephant" estates that are offered for sale, or for which changes in use are sought, because of prohibitive maintenance expenses.

The opportunity to create more parks is sometimes limited, however, by local opposition. Waterfront localities, even when unable or unwilling to pay for more parks themselves, have sometimes opposed state and federal acquisitions mainly because the new federal or state park would be available to the general public, not just to local residents. If legislation or pending court actions should cause the opening of local parks to the general public, local opposition to increased state and federal acquisition might diminish, and the opportunity to create additional parks might correspondingly increase.

POLICIES

1. Preserve natural areas along the shore

Ecologically significant areas along the shorefront should be preserved in their natural condition in the absence of a showing that development or alternative open use will result in a greater contribution to the public good.

2. Protect undeveloped land for shorefront parks

Undeveloped shorefront land needed for use as a public park should be designated and protected now to prevent inconsistent use. Land not immediately needed should nevertheless be designated if need is anticipated before the end of the planning period in 2020.

3. Acquire developed land for shorefront parks

Developed private land, suitable for shorefront park use, should be acquired as part of an acquisition strategy that seizes upon special opportunities. Areas of obsolescent development, where redevelopment or change of use is needed, should be especially evaluated for possible early acquisition as park and recreational land.

4. Encourage water-oriented commercial recreation

Restaurants, shops, theaters, and other activities that facilitate general public enjoyment of the Sound, should be encouraged in appropriate parts of the urban shorefront.

5. Design of streets near the Sound

Streets should be designed to increase public awareness and enjoyment of the Sound:

- Existing views of the Sound should be protected and new ones created.
- Local streets near the Sound should be designed principally for recreational driving and shorefront access, discouraging fast through traffic.
- New streets should not be located so close to the Sound that they destroy or limit the utility of parks or other recreational land.

PUBLIC ACCESS TO THE SOUND . . . In the future, even if a program of public land acquisition is vigorously pursued, parks and recreational lands are likely to occupy only a limited part of the shoreline of the Sound. Therefore, public access to the Sound, in addition to that provided by parks, can enhance the quality of life in the Sound area.

POLICIES

1. Provide pedestrian access

In addition to the public access provided by shorefront parks, all new shorefront development of every kind should, if legally possible, provide pedestrian access to the Sound. Developments unable to provide pedestrian access, except for water-related industries that require shorefront locations, should be located away from the shore.

2. Provide suitable transportation service

Although additional parking facilities should be provided for users of the shorefront, particular efforts should be made to provide for a variety

of transportation services for use at all times, but especially at times of peak use, both in areas where sufficient parking cannot realistically be made available within walking distance of the shore and in order to minimize land for parking which can be better used for recreational and park purposes.

IMPLEMENTATION NEEDS

Local governments have traditionally exercised primary responsibility for implementation of land use policies in the Sound area.

States have assumed a larger role in recent years (e.g., legislation in both New York and Connecticut to protect wetlands).

Federal policies also exert direct influence (e.g., impact of Federal Flood Disaster Protection Act of 1973 on development in flood plains).

Local governments remain best suited to make many land-use policy decisions. This is true because most of these decisions have their principal impact within local boundaries and because local officials are more likely than others to understand specific local conditions and preferences.

Regional needs, however, often require responses that some communities can not accept — or even be regarded as locally detrimental — for example, reservation of extensive shoreline for regionally important industry or conservation; establishment of a state park in a shorefront locality that already has sufficient beach access for local residents. Local residents cannot realistically be expected to initiate these actions, to bear their costs, or even to approve of all of them.

Implementation of regional land-use policies requires that some responsibilities be exercised by governments above the local level. Given the absence of regional governments, these responsibilities should be exercised principally by the state governments of New York and Connecticut.

2. Increase state responsibility

To implement land use policies that have significant impact beyond the boundaries of a single locality, the state governments of New York and Connecticut should assert more authority directly and should rely less extensively on the delegation of their powers to local governments.

- a. The designation of sites for natural area protection, shorefront parks, ports, and waterfront industry as well as implementing regulations and undertaking acquisitions, are particularly appropriate for early state action.
 - b. The states should also review shorefront development, either directly or through the counties or regional planning agencies. Each state should determine the boundary of its direct review area. In the interim, prior to the preparation and adoption of state coastal zone management plans, the review area boundary might include an area within 500 feet from the shore as well as any additional area less than 10 feet above sea level.
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POLICIES

1. Continue local responsibility

Land-use matters of local concern, including the innumerable policy and implementation decisions that have little or no impact beyond local boundaries, should remain the responsibility of local governments.

Map 1

GENERAL DESCRIPTION

The purpose of this map is to give a general overview of the study region's boundaries and development characteristics. In addition to describing the physical characteristics of each subregion in general terms, this map also shows areas of low density housing, urban economic activities and medium-high density housing, and the major roads and rail systems in the area.

The Long Island Sound Study Area includes six planning regions in Connecticut and parts of Westchester County, New York City, and Nassau and Suffolk Counties. The study area covers 1,889 square miles of land while the Sound itself covers 1,300 square miles.

The Valley (4) Most population in relatively small area along the Naugatuck and Housatonic Rivers. Small but growing industrial corridor along Route 8.

Greater Bridgeport (4)

South Central Connecticut (3) Intensive development around New Haven where major changes have resulted from urban renewal.

Connecticut River Estuary (2) Forest and open areas dominate. Most of the development is between the Turnpike and the Sound and close to the River.

Southeastern Connecticut (1) Forest and open areas dominate. Growing commercial/industrial area along the Thames, which includes Norwich, Groton, New London.

Fisher's Island primarily seasonal resort community.

Phum Island - Used by the U.S. Department of Agriculture.

Development "layers" along Connecticut shore to New Haven, open space and low densities north of the Merritt Parkway, medium and high densities south of it. Most development centers on corridor created by the Town Central, Boston Post Road and Connecticut Turnpike.

Southwestern Connecticut (5)

Medium to high density development around commercial cores of Greenwich, Stamford, Norwalk, Bridgeport.

Connecticut River - only major river without a city at mouth.

Eastern Long Island (8 and 9) Open space dominates. Intermittent low- and medium-density residential development along shore.

Westchester County (6a) Mature suburbs, almost completely developed - only 5 percent vacant.

New York City (6b) Sector almost completely built-up. Includes Co-op City.

Nassau County (6c) Almost completely built-up. Only 11 percent vacant.

Central Long Island (7) Medium density residential development around downtown commercial cores, lower densities between. Cores smaller than Connecticut counterparts.

MAP 1

GENERAL DESCRIPTION

LONG ISLAND SOUND REGIONAL STUDY

- URBAN ECONOMIC ACTIVITIES and MEDIUM-HIGH DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL

SOURCES: NEW YORK LUNR and CONN DOT 1969 70
- reviewed by Regional Planning Agencies 1973 74
SCALE 1 INCH = 8 MILES 1:500,000 approx

PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT



**WATER
POLLUTED
KEEP OUT**



1:THE SETTING

On July 7, 1970, the Senate Subcommittee on Executive Reorganization and Government Research began hearings on s. 2472, a bill whose subsequent passage authorized the New England River Basins Commission to study the future of Long Island Sound, and recommend goals and actions.

In his opening statement at that hearing, the bill's sponsor, Senator Abraham Ribicoff of Connecticut, offered this characterization of the Sound:

*Its protected waters have meant a harbor for the sailor and a harvest for the fisherman. It is the home for innumerable species of fin and shellfish and a way station for migratory birds. Most importantly it has been a place of beauty and pleasure for every man. But the past is only prologue . . . The unique location of Long Island Sound is the source of both its value and its vulnerability. The shoreline is a valuable resource for industrial, commercial and residential development, as well as for recreational and open space purposes. Its waters, increasingly polluted, are used for profit as well as pleasure. The many demands on the resources of the Sound are further complicated by a bureaucratic morass at all levels of government . . . This confusion has abetted the piece-by-piece destruction of Long Island Sound. We cannot afford to lose Long Island Sound. Yet, that it is an imminent possibility unless we begin to make prudent and responsible use of its assets with an eye toward the greatest future public benefit.**

*Preserving the Future of Long Island Sound: Hearings of Senate Committee on Government Operations, Subcommittee on Executive Reorganization and Government Research, Government Printing Office, 1970, Page 2.

Although the Sound is only 90 miles long and at most 20 miles wide, it is an integral part of a much larger area. Its waters come from at least as far away as the headwaters of the Connecticut River 400 miles north in northern New Hampshire. The Sound is affected by the development forces that shape the Atlantic seaboard megalopolis. That larger region now contains about 37 million people in a nearly unbroken urbanized belt extending from New Hampshire to Virginia.

Despite the importance of these long-distance relationships, the practical needs of the Long Island Sound Study required the designation of a limited area around the Sound for detailed study and analysis. The NERBC, therefore, established the Long Island Sound Study Area shown on Map 1.

In New York State, the study area is the drainage area of the Sound. In Connecticut, virtually all of which drains into the Sound, the study area includes six of the state's planning regions, of which five directly border on the Sound. The bulk of the land in the study area is in Connecticut (82 percent or 994,000 acres); while the study boundaries in New York include southern Westchester County and those portions of Bronx, Queens, Nassau and Suffolk Counties that most immediately relate to the Sound.

The entire study area, except the two planning regions in eastern Connecticut, lies within the New York Metropolitan Region. For many reasons, land use and development within the study area are best understood when viewed from a regional perspective. The economic and cultural attractions of New York City have stimulated growth within the study

area, as in the rest of the region. And extensive development, especially since World War II, has occurred in response to continuing migration of

residents, business and industry from older city centers. Map 1 shows the settlement patterns that these growth forces have so largely fashioned.



Needs of the elderly in the Study area are becoming more visible. The rapidly expanding elderly population, for example, is a major factor in pressure for multi-family housing.

2:PEOPLE, LAND, & SETTLEMENT

PEOPLE

The population of metropolitan New York will grow during the rest of this century, but probably not as much as anticipated a few years ago. Current population estimates of the Tri-State Regional Planning Commission* assume that national fertility rates will stabilize at 2.1 children per family — the so-called "replacement" rate. Even so, with anticipated in-migration, the population of the New York Metropolitan Region is expected to grow from almost 19 million in 1970 to nearly 25 million in the year 2000. Population is expected to level off thereafter at about 28 million.

Of the total regional population, the LIS study area's share is expected to increase only slightly, from 12 percent in 1970 to about 12.3 percent in 2000. OBERS projections for the study area show growth from about 2.26 million in 1970 to more than 2.8 million in 1990, more than 3 million in 2000 and nearly 3.5 million by 2020.* This represents an increase of 20 percent by 1990, and more than 50 percent by 2020.

Within the study area, the additional residents will not be evenly distributed. As shown by Map 2, the outlying portions of the area are expected to

receive most of the growth. If past patterns of growth continue the population of some outlying subregions will more than double.*

Sharper Gain in Households

The number of households is expected to increase much more sharply than the number of people, particularly between now and 1985. An expected rise in the proportion of one-person households and elderly couples will account for much of this increase.

In 1970, the New York Metropolitan Region had more than 6.3 million dwelling units, an average of 2.92 people per unit. The average is expected to decline to 2.76 people per unit in 1985, and 2.66 by the year 2000.

For the LIS study area, estimates of household size are unavailable. To provide some idea of the number of households that the study area should expect, estimated household sizes for the region have been applied to the existing and projected populations within the study area. The result, as explained more fully in Appendix B, Reference Table II, shows a 69 percent increase in the number of households within the study area between 1970 and 2020, compared with a population increase of slightly more than 15 percent. Even more remarkable is the estimated 27 percent increase in the number of households during the 15 years from 1970 to 1985. If these necessarily rough figures are even approximate guides to the future, housing needs within the study area will rise very sharply indeed.

*See Appendix B, Reference Table I

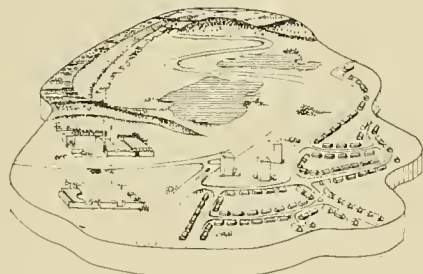
*Tri-State's " 'planned capacity' estimates are derived on the basis of duly adopted regional values, goals and policies and through negotiation toward concurrence with sub-regional planning agencies." (*The Long Island Sound Region: An Economic Perspective*, p. 16) OBERS projections represent the unified effort of the Bureau of Economic Analysis' predecessor, the Office of Business Economics (OBE), Department of Commerce, and the Economic Research Service (ERS), Department of Agriculture. For detailed projections and comparisons of OBERS projections with other projections and estimates see: *1972 OBERS Projections — Regional Economic Activity in the U.S. Volume 1* and *The Long Island Sound Region: An Economic Perspective*.

LAND

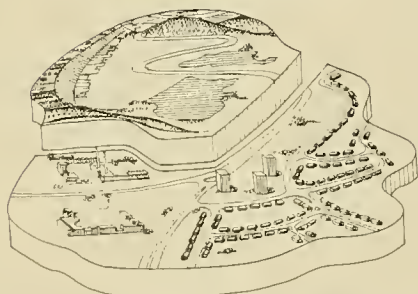
How much land are the additional residents and households likely to occupy? The answer depends in large measure, on future population density patterns — how and where people and activities will be distributed on the landscape.

The distribution of natural resources in the area is shown on Map 5. Current conflicts over the use of land in the LIS area are described in Chapter 4.

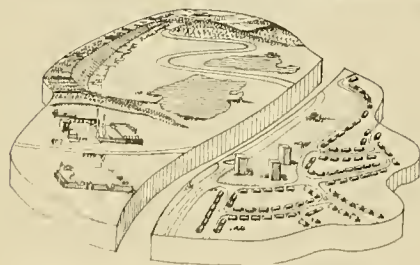
In the whole LIS study area, developed land (i.e., land used or developed for residential, commercial, industrial, institutional or other activities associated with human settlement) occupies 606.2 square miles. Of this amount, 439.6 square miles are residential.* Therefore, based on a 1970 population of 2.26 million, the study area has the following densities:



$$\text{Gross Density} = \frac{\text{Population}}{\text{Entire Area}}$$



$$\text{Developed Land Density} = \frac{\text{Population}}{\text{All Developed Land}}$$



$$\text{Residential Land Density} = \frac{\text{Population}}{\text{Residential Land}}$$

*See Appendix B, Reference Table III

STUDY AREA DENSITIES

	Persons Per Sq. Mile	Persons Per Acre
Developed Land	3,730	6
Residential Land	5,144	8

The older settled portions of the study area have much higher densities. Seven towns containing central cities — Norwich, Groton-New London, New Haven, Bridgeport, Norwalk, Stamford and Mount Vernon — accounted for about 30 percent of the 1970 population of the study area. Reference Table IV in Appendix B shows the average densities of the seven towns.

TOWNS CONTAINING CENTRAL CITIES

	Persons Per Sq. Mile	Persons Per Acre
Developed Land	7,195	11
Residential Land	10,000	16

The two largest towns in Connecticut — New Haven and Bridgeport, and the largest population center in Westchester County — Mount Vernon — have still higher densities:

LARGEST URBAN CENTERS

	Persons Per Sq. Mile	Persons Per Acre
Developed Land	11,320	18
Residential Land	19,357	30

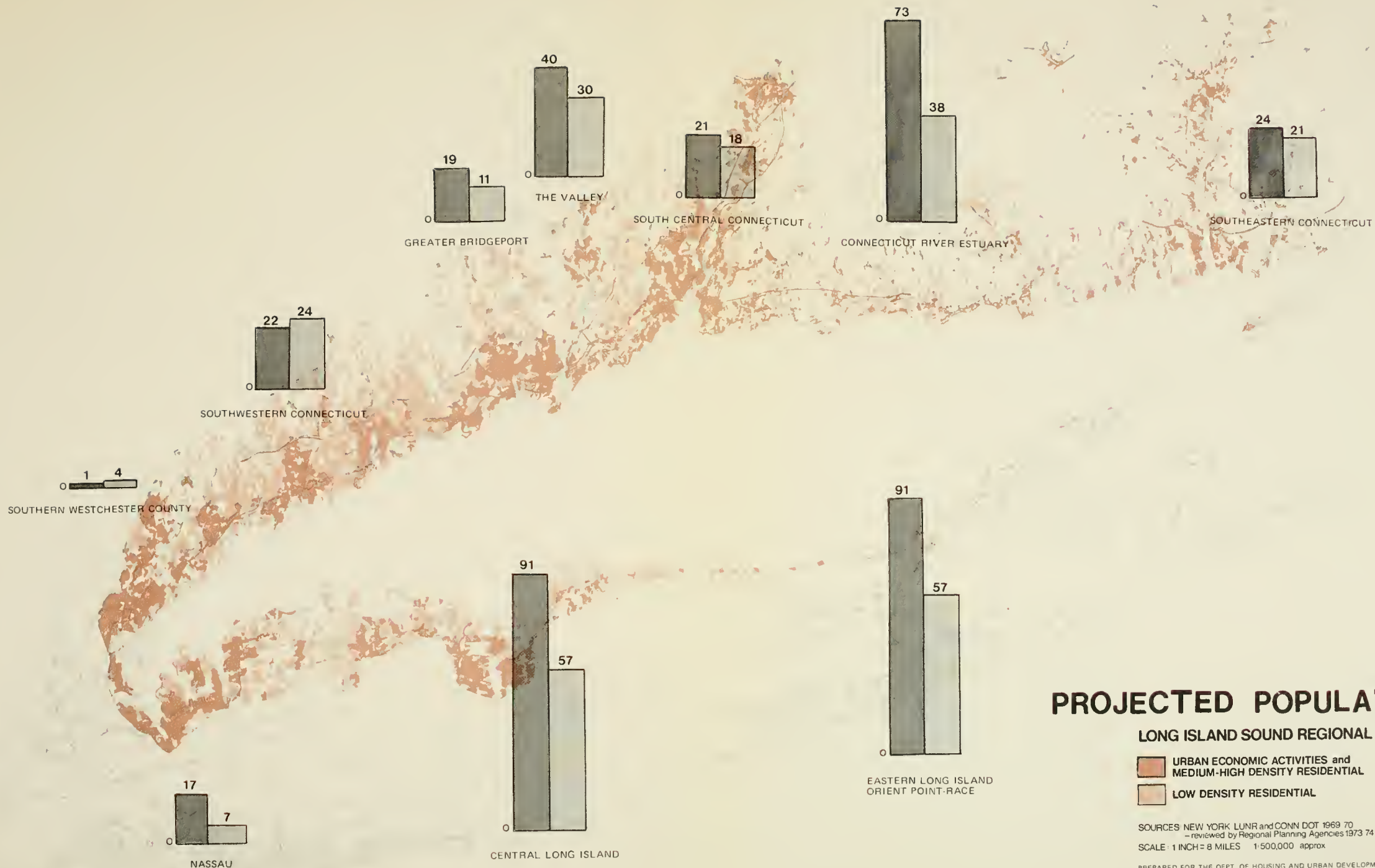
Given density increases resulting from renewal and from highrise construction occurring within these areas, an average developed land density of 10,000 persons per square mile seems reasonable for the more heavily urbanized portion of the study area.

Newly developing areas may provide the best clue to future growth. Seven selected Connecticut towns — Ledyard, Clinton, Killingworth, Monroe, Shelton, Guilford, and Wilton — each grew by 50 percent or more between 1960 and 1970. Three experienced a population gain of 100 percent or more. The average 1970 densities for the seven

Map 2

PROJECTED POPULATION

This map shows the % population increases between 1970-1990 and 1990-2020 for each subregion on a base map of developed land. This map shows that the principle growth is expected to occur in the Connecticut and Suffolk County portions of the study area.



MAP 2 PROJECTED POPULATION

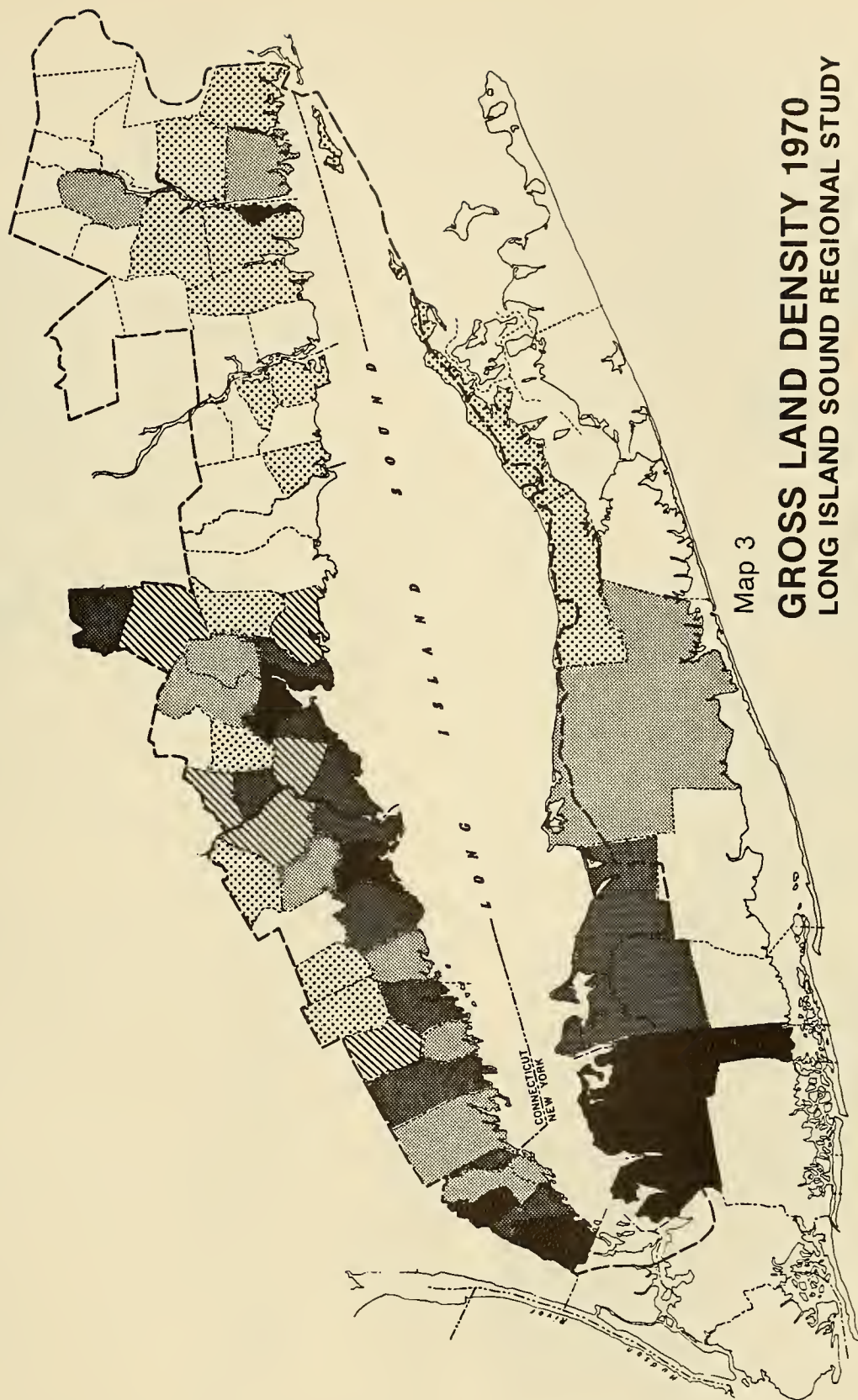
LONG ISLAND SOUND REGIONAL STUDY

- URBAN ECONOMIC ACTIVITIES and MEDIUM-HIGH DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL

SOURCES: NEW YORK LUNR and CONN DOT 1969-70
 — reviewed by Regional Planning Agencies 1973-74
 SCALE: 1 INCH = 8 MILES 1:500,000 approx

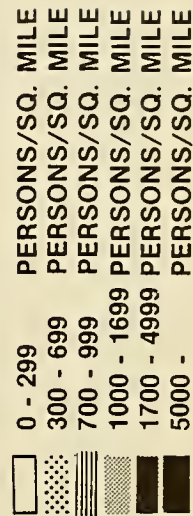
PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
 BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT





Map 3

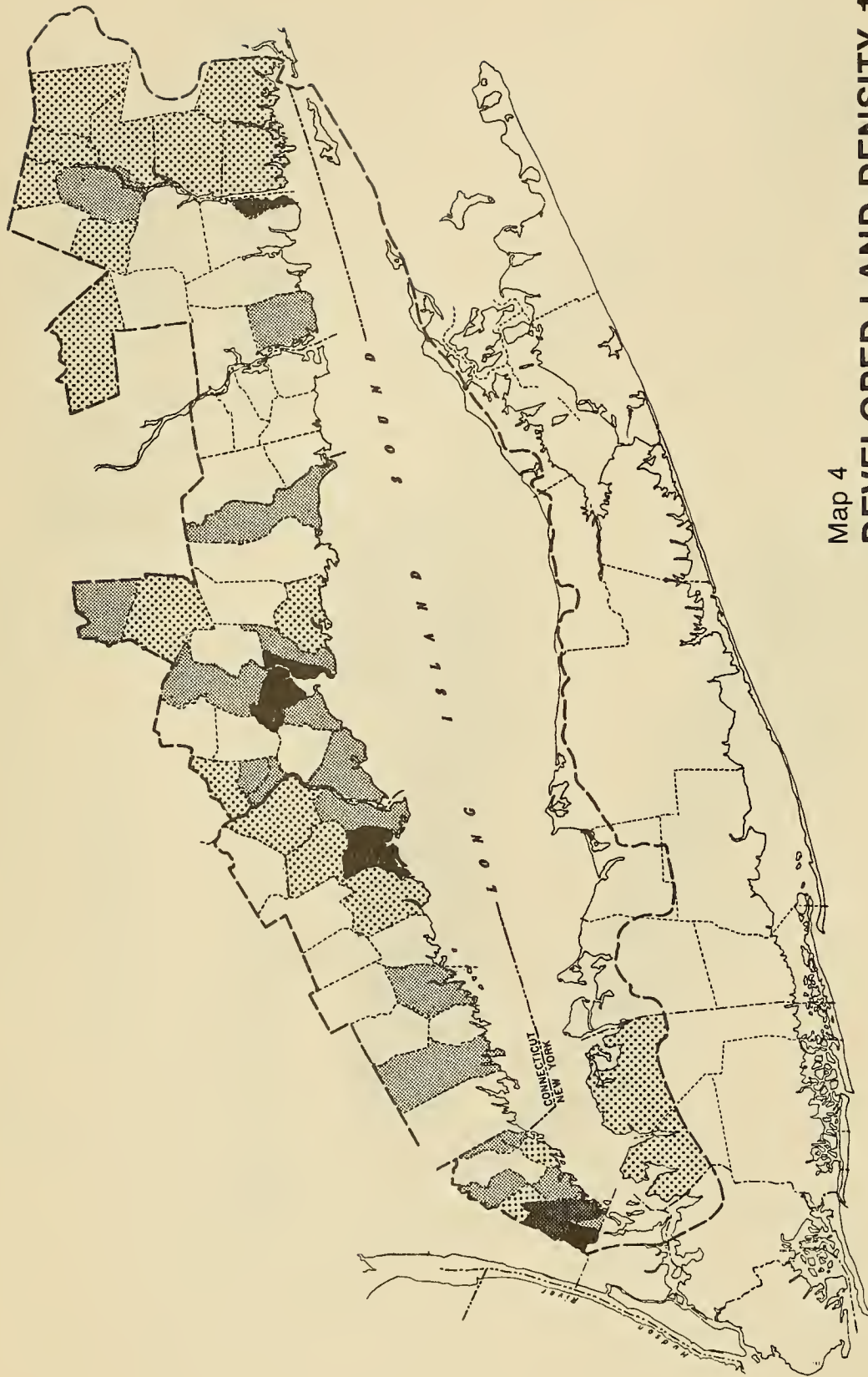
GROSS LAND DENSITY 1970 **LONG ISLAND SOUND REGIONAL STUDY**



SOURCE: NEW YORK LUNR and DOT;
 THE LONG ISLAND SOUND REGION,
 AN ECONOMIC PERSPECTIVE
 SCALE: 1 INCH = 14 MILES 1:875,000 approx.

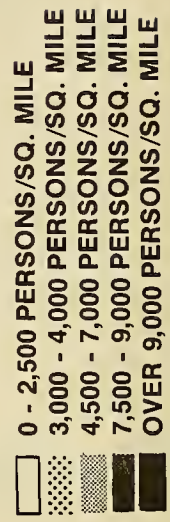


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 BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT



Map 4

DEVELOPED LAND DENSITY 1970 LONG ISLAND SOUND REGIONAL STUDY



SOURCE: NEW YORK LUNR and DOT;
 THE LONG ISLAND SOUND REGION,
 AN ECONOMIC PERSPECTIVE
 SCALE: 1 INCH = 14 MILES 1:875,000 approx.

PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
 BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT



towns were as follows:

AREAS OF MOST RAPID GROWTH		
	Persons Per Sq. Mile	Persons Per Acre
Developed Land	2,536	4
Residential Land	3,093	5

SETTLEMENT

The foregoing figures suggest four distinct possible patterns of future settlement. They are:

POSSIBLE PATTERNS OF FUTURE SETTLEMENT	
Development portion of entire study area	3,500 persons/sq. mi.
Largest Urban Centers	10,000 persons/sq. mi.
Towns containing major urban centers	7,000 persons/sq. mi.
Areas of most rapid growth	2,500 persons/sq. mi.

Which, if any of the densities is future development most likely to achieve? The answer is far from clear. It may be unrealistic to assume that future growth will achieve the densities of older central cities such as Stamford, Norwalk, or New London. Yet the following trends and conditions challenge the contrary assumption that all future development will occur on open land at the low densities now typical of newly developing areas:

1. Declining birth rates, smaller families, and a growing older population may combine to spur an increased demand for smaller dwelling units. And the need for less floor space, the increased proportion of single adults, young couples and the desire of working wives for housing near employment centers could stimulate demand for apartment living — a trend that has already begun.
2. A projected trend toward a heavier concentration of office jobs in compact urban centers may also encourage more centralized city development. Service jobs — in retailing, personal services, and transportation — will represent 56

percent of all employment in the New York Metropolitan Region by the year 2000.

3. "Infilling" of vacant parcels in developed areas is likely to absorb a considerable proportion of the population increase. Renewal of deteriorated areas within central cities could accommodate another smaller proportion of the projected increment. Together, infilling and renewal could absorb enough of the population increase to reduce the pressure on open land by at least 20 percent.
4. On the other hand, the disproportionate increase in the number of households may work toward higher per capita floor area and, hence, increased land demand.
5. Projected increases in employment and fewer children per family will mean increases in per capita income. By 2000, income should be about twice the 1969 level; in constant dollars \$7,924 per person compared to \$3,864 in 1969). If consumers spend their expanded income for second homes or third automobiles, additional dispersion could result. Basic transportation decisions for the region, which could counteract the tendency toward dispersion, have yet to be made. The prospect of a continued need for energy conservation may encourage both the attempts to revitalize mass transit and any tendencies toward more centralized development.



Crowded marina in Port Washington reflects population growth in the Study area affluence and the magnetic pull of the Sound's recreational treasure.

3: CURRENT PLANS

Since the boundaries of the LIS study area were drawn to reflect drainage patterns rather than administrative divisions, the study area cuts across many established state, regional, and local planning jurisdictions.

INTERSTATE PLANNING

Tri-State Regional Planning Commission. The Tri-State Regional Planning Commission is an interstate planning agency covering 22 counties in New York, New Jersey, and Connecticut. Its area of jurisdiction includes New York City, Westchester, Nassau, and Suffolk counties in New York State, and four of the six planning regions in the Connecticut portion of the LIS study area. The Commission has prepared a Regional Development Guide Plan, as well as functional plans on outdoor recreation, transportation, and a regional plan for water, sewage, air, and refuse. The agency encourages coordination among all planning and transportation agencies within the Tri-State Region. (There has been cross-acceptance of land use plans between Tri-State and those planning agencies within Tri-State's area of jurisdiction.) The federal government has designated it as the official clearing house agency for federal level programs and projects to be carried out in the Tri-State Region.

Regional Plan Association. As part of its activities, the Regional Plan Association, a private nonprofit citizens organization, is also concerned with a large portion of the LIS study area. Choices for '76, an RPA-sponsored program, included a series of television programs, publications, and public meetings on problems facing the New York Metropolitan Region. The program focused on

clarifying the choices involved in decisions on housing, transportation, the environment, poverty and cities and suburbs. The Second Regional Plan presents region-wide plans and policy proposals to the year 2000.

STATE PLANNING

The two states concerned with the Long Island Sound Region have planning agencies — the Connecticut Department of Finance and Control, Planning and Budgeting Division, and the New York State Office of Planning Services — which generate policies and planning recommendations affecting the study area. Apart from considering the geographical deployment of populations and economic activity, these agencies shape policies affecting region-serving support systems such as waste disposal, limited access highways, and public transportation.

New York State has two official plans. One stresses patterns of physical development, while the other encourages sound environmental practices. (See Appendix C for a detailed description of each.)

"A Proposed Plan of Conservation and Development" for Connecticut (1973) sets forth basic policies to conserve land and water resources. (See Appendix C). As in the New York State Plan, the State of Connecticut would assume the role of coordinator and arbiter of land and water use policies to assure the appropriateness of development decisions. Neither the New York nor Connecticut plans, however, construes the coordinating role as a substitute for planning at the local level.

REGIONAL PLANNING

Both Connecticut and New York are divided into substate county and regional planning areas. The regional planning agencies in the Connecticut section of the study area are: Southwestern Connecticut, Greater Bridgeport, the Valley, South Central Connecticut, Connecticut River Estuary, and Southeastern Connecticut. The New York sector of the study includes the New York City, Nassau-Suffolk, Nassau, Suffolk, and Westchester County planning agencies. With the exception of the Connecticut River Estuary Regional Planning Agency, each of these agencies has land use plans for its area of jurisdiction. The major land use policies of these regional planning agencies are summarized in Appendix C. Their recommendations are generally addressed to their member towns.

LOCAL PLANNING AND REGULATIONS

Much of the power to affect land-use decisions has been delegated by the states to the multitude of cities, towns, and villages, engaging in planning, zoning, and conservation activities. Most specific public decisions guiding the nature, size and location of residential, commercial, and industrial activities originate at this level.

Of measures used by local governments to provide land-use guidance, regulations are by far the most common. Local zoning and subdivision regulations apply to virtually every part of the study area. Of the 60 localities in the Connecticut portion of the Long Island Sound region, all have zoning regulations. Localities in the New York segment of the study area also have well established zoning regulations. Additional controls — the result of many local ordinances — supplement these basic regulations, as do relatively more recent state laws and regulations.

Despite marked variations among communities, local land use regulations typically seek to attain the following objectives:

1. Physical compatibility among uses. Zoning originated in many places as a protective response against proposed developments that citizens viewed as incompatible with what already existed, or with their hopes and plans for the future. Often, the unwanted development did clearly clash with the character of an existing use — perhaps a junkyard or factory in a residential area. Citizens often regarded such

proposed uses as destructive of nearby property values, although sometimes their concern focused on the reduced enjoyment of neighborhood properties. The usual response was to limit the “undesirable” activity to a specified part of town. Smaller communities often banned such activities completely. Over the years, regulations have sought to prevent other physical incongruities as well, particularly developments that would overtax streets, sewers, and other public facilities.

But regulations have proven to be inadequate tools, even for achieving physical compatibility. Sometimes, they do not prohibit enough; other times too much. The commercial strips that line long stretches of the Post Road in Connecticut or Route 25A on Long Island illustrate the first inadequacy. Rigidly uniform zoning such as the provisions that restrict vast areas to houses on one-acre lots, illustrate the latter one. And in their mechanical assumption that “mixed uses” are inherently wrong, some physical planners have worsened the situation by failing to perceive that a mix of activities, if properly situated, could enrich the life of a town or a region. Meanwhile, the search continues for techniques that offer an intelligent middle ground between an “anything goes” approach and one that is overly restrictive.

- 2. Environmental compatibility.** In addition to the demand for physical compatibility among uses, a strong feeling has arisen in recent years that new development should harmonize also with the natural environment. This concern can express itself, for example, in the reduction of permitted densities in steeply sloping areas or by forbidding development in wetlands. Sometimes, it manifests itself in site plan procedures that attempt to control design or restrict the amount of land used for development. The concept of clustering or “planned unit development” exemplifies this approach. Sometimes, however, “environmental compatibility” can become a ruse for exclusionary practices, or an all-encompassing rationale for a nogrowth policy.
- 3. Keeping tax bills down.** In many communities, this is a key regulatory objective. Some of the most far-reaching measures (they are usually contained in subdivision regulations) shift many of the facilities costs that used to fall on taxpayers generally to developers and ultimately to home buyers. And in the game of “fiscal zoning” public officials welcome net taxpayers

(e.g., many industries) and keep out net tax burdens (e.g., some homes). Large-lot zoning, requiring two or five or even more acres per dwelling, is often used for this purpose, although it can also serve other aims.

- 4. Social compatibility.** Although exclusionary regulations often have a financial objective, some municipalities invoke them for social reasons as well. The social objective seems to be one of social compatibility — to exclude those who “wouldn’t fit in” with those already there. It is seldom formally expressed in this way, however.

A Future for Regulations?

For all their shortcomings, local regulations effectively accomplish some objectives, and the public costs of adopting and administering regulations appear to be lower than the costs of equally effective alternatives such as outright public acquisition.

It is not surprising, then, that state and regional plans in the study area also place heavy emphasis on regulatory curbs and requirements as a means of implementing policies. The plans strike insistent themes: protection of wetlands, shorelands, flood plains, prime agricultural land, fish and wildlife habitats, and areas below the earth’s surface capable of producing water. Even for less sensitive areas, some plans seek restrictions to assure that development respects natural processes and does not overtax natural capacities for dissipating pollutants. Still other regulations, not limited to particular areas, would control potentially damaging activities such as gravel mining, dredging, and filling.

One practical limit on the effectiveness of regulations stems from their impact on the value of regulated property. Although the prevalence of large-lot zoning within the study area suggests that communities are sometimes willing to impose restrictions that greatly reduce values, the resistance of local property owners to restrictions remains high. The speculative developer holding land in anticipation of selling it is unlikely simply to accept a new regulation curbing development. And the more far-reaching the controls — such as those virtually barring development of wetlands — the more they seem to be resisted. Recent experience suggests, however that controls are becoming acceptable when the public benefit is sufficiently clear.

But even where legislators are willing to adopt strong regulations, the constitutional validity of some of the more rigorous restrictions is not yet clear. One important test case, currently in litigation, involves the Rykar Industrial Corporation of Stratford, Connecticut, and its attempt to reverse a state decision barring construction of a deep sea harbor facility on 600 acres of land in Stratford’s Great Meadows, part of which has been designated by the Department of Environmental Protection as wetlands. The Rykar Corporation maintains that the firm is being denied the highest and best use of land. In December, 1973, Hartford Superior Court denied an appeal of the original decision against Rykar, but the Corporation has made a motion to set aside the judgment, and also requested an extension of the deadline to file an appeal to the Supreme Court.*

There are other practical limitations on the effectiveness of regulations. Where public policy calls for stimulating rather than restricting construction — where it seeks to accelerate a lagging demand for center city development, for example — regulations often can do little. Sometimes, the practical constraint may simply be the absence of the professional skills (and funds needed to obtain them) that should be available to assist in administering the regulations.

The widespread fear of excessive outside intervention in local affairs suggests that local governments are likely to retain a good deal of responsibility for regulating land use. Problems will continue to arise, however, because regional and local interests often conflict, as when a regional policy encourages accessibility to a particular area but there is a strong local resistance to opening it up to outsiders. Local agencies often assign low-priority to carrying out regional plans and policies.

In general, the differences between regional and local plans in the study region can be summarized as follows:

Plans prepared by the regional planning agencies share certain common policy viewpoints. All of the plans assert that land-use decisions must consider land and water capabilities and limitations. The regional planning agency plans also recommend that development be confined and related to existing centers and to transportation focal points and corridors. The plans treat Planned Unit

*DEP CITIZEN’S BULLETIN, Volume 1, Number 5, Hartford, CT, Department of Environmental Protection, February 1974, p.7.

Development (PUD) as generally preferable to the traditional single family house on its own lot, and generally include the preservation of open space as an important objective.

The value of most regional planning, however, is diminished because it (a) omits costing and programming, (b) fails to deal systematically with the limitations of the natural environment, consequently leading to policies that do not balance development against environmental considerations, and (c) lacks the legal or administrative mechanisms for implementing its recommendations.

In contrast with regional plans, local plans tend to have the following characteristics:

1. Large areas of undifferentiated density showing no explicit recognition of the cluster or planned unit development potential.
2. Smaller open space allocations than regional plans, and no apparent relation to the uniqueness of shoreline resources.
3. Allocation of more land to commercial and industrial use. (From map observation, designations do not appear to flow from analysis of other interrelated functions or activities.)
4. Less responsiveness to the environmental determinants of regional population demands as well as to regional income, recreation and employment needs. (Financial constraints may account for this, or it may be that most municipalities favor maintaining the developmental status quo regardless of broader population and economic considerations.)

THE INCREASING ROLE OF THE STATES

When other governments — federal, state, or county — set out to overcome problems arising from local-regional conflicts, they often seek to influence the local regulatory process rather than take over the job directly themselves.

Technical and financial assistance as well as persuasive techniques are perhaps the most common methods. Intermunicipal consultation procedures, for example, or joint projects at the regional level, may create awareness of problems that extend beyond the local level. State plans often provide for both technical and financial assistance.

Incentives may come as carrots: offers of federal

funds for planning, or to build public housing or buy open space, if various requirements are met. Incentives are usually economic. Some laws, for example, give "bonuses" to builders who act in ways that are desired even though not required. Laws in both New York and Connecticut authorize lowering of real estate tax assessments in an effort to encourage continued farming of agricultural land. Incentives may also come as sticks, as when Connecticut threatens to regulate wetlands directly if localities do not take the initiative themselves.

In addition, state action can simply change the conditions that cause localities to act as they do. The New York Development Plan, for example, recommends tax changes to remove the reason for much intermunicipal competition.

Requirements applied to local governments are most often procedural — directing that public hearings be held, for example. Increasingly, these are being supplemented by substantive requirements with which localities must comply.

In recent years, more states have resorted to direct regulation to implement land use objectives deemed sufficiently important as, for example, power plant siting. For these purposes, the state effectively bypasses local officials and deals directly with developers and landowners.

A number of states have gone considerably further than either New York or Connecticut in instituting state level controls. As early as 1964, Hawaii established statewide zoning with which local regulations must be consistent. Vermont adopted the Land Use and Development Law of 1970 (Act 250) creating a permit system to regulate all private and public industrial and residential development of consequence.

Maine passed a site location law in 1970, requiring large commercial and industrial developments to seek permits from the state's Department of Environmental Protection. Residential subdivisions of more than 20 acres or those requiring effluent discharge permits from the state also must be approved at the state level.

In 1972, the Florida legislature adopted a land management bill designating two categories of state supervision, "areas of critical State concern" and "developments of regional impact."

The influence of these actions and of the forces that led citizens of these states to demand them, is bound to be felt within the study area in the years ahead.

IMPACT OF FEDERAL ACTION

Despite recent Congressional rejection of land-use policy legislation, federal influence on land use within the study region is pervasive. Federal spending, taxing, and regulatory measures have long established much of the context within which developers make their decisions. The environmental legislation of the 1970's has markedly increased federal influence.

The National Environmental Policy Act requires the preparation of Environmental Impact Statements in connection with federal actions that significantly affect the environment. Statements are required not only for projects initiated by the federal government but also for the numerous projects that receive significant federal financial



Oil slick covering New Haven Harbor illustrates but one of the problems that redevelopment of the shorefront has yet to solve. Tanker ESSO hit reef in 1970 and its bottom split open, spreading pollution for many miles around. Similar accident occurred in 1974.

assistance. When the statement process is working effectively, the environmental consequences of proposed actions are explored and publicized, and proposed actions are modified in response to the awareness thus created.

Under the Clean Air Act of 1970, the federal government has established national ambient air quality standards to protect the public health and welfare. As required by the Act, New York and Connecticut have adopted implementation plans to assure that national standards are met within each state. The states are further required to limit deterioration of air quality in areas where air is cleaner than the standards require. Although most air pollution controls focus on the use of available

control technology to limit pollutant emissions, the controls also restrict the location of some land uses. Major new polluters may be excluded, for example, from areas where pollutant levels are already unacceptably high. Particular attention is now being paid to the location of so-called "complex sources," activities that generate substantial automobile traffic.

The Water Pollution Control Act Amendments of 1972 (PL 92-500) establish national water quality goals and a national program to achieve them. The program includes the establishment of specific effluent limitations, a permit system, construction grant assistance for waste water treatment facilities, and areawide planning. Implementation efforts, like those under the Clean Air Act, focus on the use of available waste control technology but also significantly affect land use. Public decisions about the location and capacity of wastewater treatment and collection facilities, as well as the timing of their construction, will influence urban growth patterns. The areawide planning provisions of the act, if effectively implemented, can have even more far reaching impact.

The Flood Disaster Protection Act, enacted in 1973 in response to an alarming increase in flood losses across the nation, is expected to cause widespread adoption of flood plain regulations and flood proofing requirements. Localities with flood prone properties are under very strong pressure from the Act to participate in the federal flood insurance program and to adopt flood plain regulations with effective enforcement provisions. Failure to adopt regulations can result in denial of federal financial assistance to the community and prohibition of certain loans by federally insured, regulated or supervised lending institutions. Given the strength of these sanctions and the seriousness of the flood risks that gave rise to them, the Act could well eliminate virtually all new damage-prone development in floodable areas within the study region.

No single level of government can, by itself, resolve the problems and seize the opportunities presented by the Long Island Sound region. Clearly, there must be continued reliance on localities to satisfy local needs. Some problems, however, can be perceived only when large areas or high impact uses are being considered, and in such cases, they may be most effectively resolved — politically, technically or economically — only at higher levels of government.



Sunday evenings find many city dwellers on the Connecticut Turnpike, returning from their "weekends in the country."

4: ISSUES & OPPORTUNITIES

Wide variations in development densities and settlement patterns occur throughout the study area, not only among subregions, but even within towns in the same subregion. Heterogeneity of population, diversity of natural settings, and distance from New York City give rise to different types of pressures. The pressures, in turn, shape the problems or issues faced by town, county and state governments in the study area.

Generalizations can be misleading, but some of the major unresolved problems and issues relating to land use in the study area include:

- Proliferation of office buildings and corporate headquarters in areas once regarded as exclusively residential.
- Industrial decline and job losses in some areas, particularly central cities.
- The dearth in older developed core towns and suburban areas of multi-family housing for low-and moderate-income families and the elderly.
- Local resistance to providing sewerage systems ordered by the states.
- Disposal of industrial wastes in tributary water bodies.
- Conflict over the industrial use of waterfront locations as opposed to residential and water-oriented park and recreational use.
- Pockets of deteriorating seasonal housing along the shore.
- Conflicts over the location of power plants, as a result of both population pressures and private

corporate needs, highlighted by fears about the potentially damaging impact on the environment.

- Lack of efficient mass transportation throughout the study area, despite continually growing pressures for an interurban high speed rail system.
- Conflict over the use of natural areas for recreation as opposed to conservation.
- Lack of recognition of the ecological importance of prime forest and agricultural lands and the potential disruption their urbanization would cause.
- Limited accessibility of beaches and marinas as a result of population and development pressures, inadequate parking space and local residence requirements.

How should any parcel of land be used? Who should use it? The main problems of the study area boil down to those questions. The resolution of land use conflicts depends, in part, on identifying land areas that have special attributes for particular purposes.

It does not automatically follow that every such area should be put to the use for which it now seems especially suited. One area, for example, may have features that make it attractive for multiple use (e.g., prime agricultural land located near an expressway interchange). In another area the supply of land especially suited for a particular use may exceed the foreseeable demand. Any decision, however, to use an area for activities that appear inappropriate should flow out of a

conscious awareness of the opportunity that such a decision would foreclose. By the same token, designation of an area for a particular use should also include consideration of other compatible opportunities that can be seized without disrupting the primary resource use.

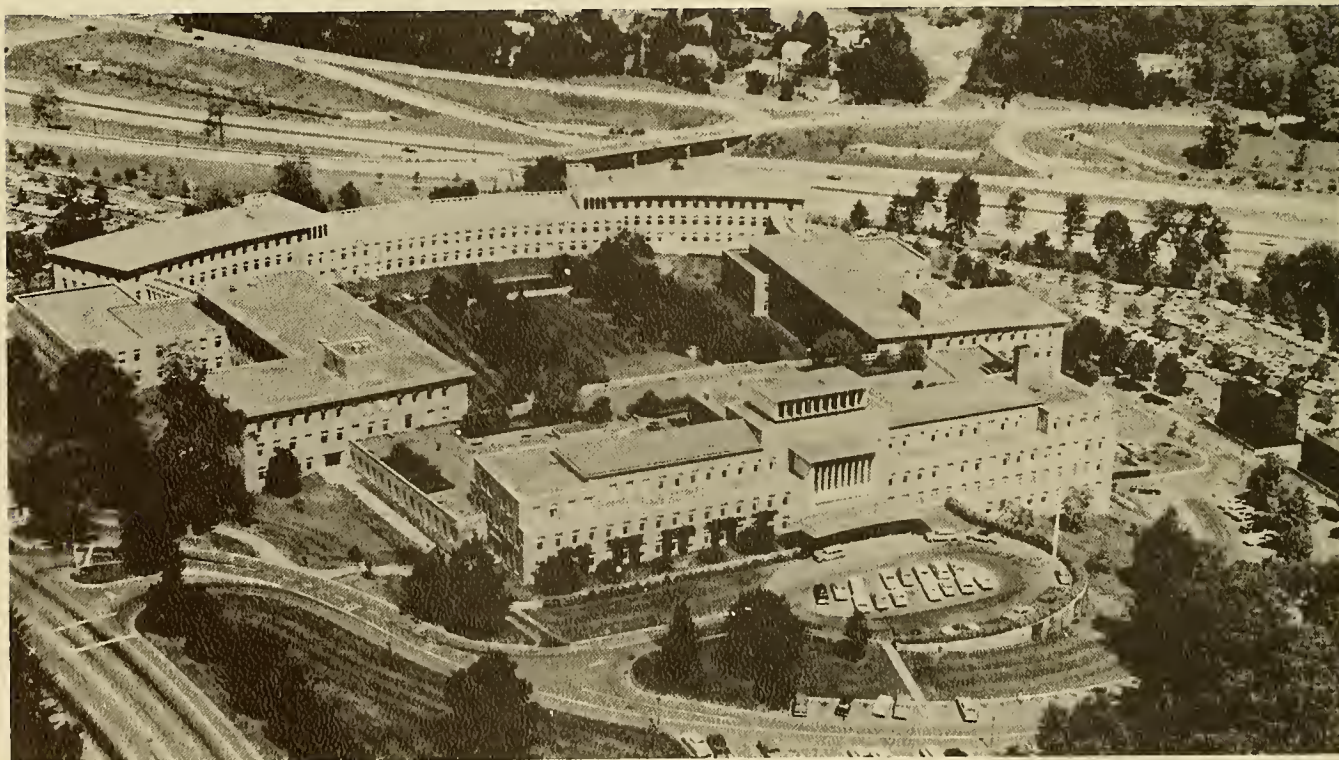
While it is impossible to cite every type of land use problem or opportunity area that merits attention throughout the study area, County and Regional Planning Agencies have helped the Land Use Work Group to identify problems that are applicable to the larger study area. In the following discussion, where a problem is identified as relevant to a town or subregion, that jurisdiction has been named to make the example more concrete.

Available research methods permit the identification of some, though not necessarily all, of the special opportunity areas. During the LIS study, most of the work groups gathered material in an effort to identify the special resources of the study area. The natural resource map included in this report indicates the extent and distribution of natural resource areas throughout the study area, while Map 7 indicates special opportunity areas, particularly along the shore.

GROWTH AND DEVELOPMENT

While growth, itself, is hardly a problem, growth patterns — the type, rate and densities of residential, commercial and industrial development — are matters of active debate. In some areas — the Connecticut River Estuary, for example — residents appear to favor no growth at all. Between 1960 and 1970, the population of the Connecticut River Estuary area increased 60 percent, heralding a change from rural to suburban development. The dominant issue that confronts this subregion is whether it can keep the qualities of a rural-recreational environment without impairing economic vitality or restricting a person's right to work and live where he chooses.

Responses to industrial and commercial growth vary throughout the study area. In recent years, the western end of the study area has been a terminal point for corporation moveouts from New York. Some towns are encouraging such relocation. Others are torn between the desirability of fattening their tax rolls and the wish to avoid possible downgrading of commercial uses to less desired manufacturing activities.



General Foods building in White Plains typifies a steady regional and national trend: the establishment of corporate headquarters in suburban areas that once were solely residential.

In subregion 5, Southwestern Connecticut, initial acceptance of low-density campus-office development has changed to fervent opposition in Greenwich. After American Can Company moved its corporate headquarters from New York to the extreme northwest corner of Greenwich in August 1970, town officials hailed the move as a boon to Greenwich's tax base. Then, the Xerox Corporation purchased 104 acres in upper Greenwich more than two years ago for a new 20 million dollar corporate headquarters. Later, it sought a zoning change to have a part of this area declared an "airport impact area" unfit for residential use because of noise pollution from nearby Westchester County Airport. On November 20, 1973, however, the Greenwich Planning and Zoning Commission rejected Xerox's proposal. By contrast, cities such as Bridgeport, which have suffered a decline in industrial activities and employment, are trying to lure migrant firms back.

Multi-Family Housing

Throughout the LIS study area, there is increased pressure for a relaxation of zoning controls to permit higher density residential development. This pressure is generated not only by builders, but by civil rights groups supporting equal opportunity in housing, and by local groups seeking housing for the elderly, municipal workers, young married couples, singles, and employees of companies that have recently moved from central city to suburban locations. While various localities have successfully opposed much of this pressure until now, the demand has not abated, and it seems only a matter of time before the resistance will crack under the weight of judicial decision or public protest.

In Southeastern Connecticut, for example, the presence of Navy families attached to Groton's submarine base, the influx of industrial workers and the needs of the elderly have combined to generate a strong demand for multi-family housing. Apartments and condominiums are rising in Groton, New London and Norwich. Indeed, since 1970, several hundred units have been built in Groton alone. But the demand far exceeds the supply, and were it not for inflated land prices and construction costs as well as high mortgage interest rates, building activity would be considerably greater.

A similar demand exists in subregion 4 (Greater Bridgeport), particularly in the suburban towns where multi-family housing has been unavailable or limited in the past. As in Southeastern Connect-

icut, growing recognition of the housing needs of the elderly may be an added spur to development of multi-family dwelling units. The Planning and Zoning Commission of both Monroe and Trumbull, for example, are now considering Design District regulations making special exceptions for such housing.

Urban Decay and Redevelopment

In many subregions, urban deterioration within city or town centers is a serious problem. This is true of larger cities such as Bridgeport and Norwich as well as smaller jurisdictions such as the Village of Greenport where a considerable segment of the housing stock is old and in disrepair.

The mix of industrial, residential, commercial, and recreational activities on the shoreline underscores the importance of shaping prudent policies for the shorefront's future use in all of the major urban centers along the Sound.

Traditionally, urban centers in the study area — Stamford, White Plains, New Haven and New London — to name the outstanding examples — have responded to their problems through urban redevelopment. In those instances where urban decay was concentrated at the shoreline, industrial users have moved to better locations leaving behind outmoded buildings, rotting wharves and polluted harbors.

Since 1947, the renewal process has physically and economically transformed New Haven Harbor, including the West, Mill and Quinnipiac Rivers. The following matters, however, remain unresolved and are typical of the multi-use harbors in the study area:

- Elimination of pollution in the inner harbor and upgrading of water quality; elimination of debris along the shores of the harbor;
- Expansion of general cargo capacity;
- Ultimate elimination of tank farms from the harborside and relocation inland; determination of economic feasibility of offshore petroleum product transfer;
- Use of the shoreline for recreation, higher density residential units or industry;
- The presence of heavy industry along the banks of the Mill and Quinnipiac Rivers;
- Location of secondary waste water treatment plants;

- Earmarking of a 25 acre city-owned tract adjacent to the Long Wharf for industrial, harbor oriented activity.

MUNICIPAL SERVICES

One of the major indicators of where growth may occur in the study area is the planning for new sewerage facilities. While sewerage is just catching up to development in some areas along the shore, the availability of trunk lines will inevitably attract new development. Herein lies a basic dilemma. Sewerage improves water quality and, at the same time, establishes the precondition for additional development. Areas which are likely to be sewerage by 1990 and 2020 are shown on Map 9, Appendix B and are derived from regional water and sewer engineering studies.

Increasing concern with the environment (manifested in federal and state air and water quality standards and regulations) has focused more attention on plans for domestic and industrial waste water treatment systems.*

Sewer and Water Facilities

The impact of new municipal services and the effectiveness of existing systems in supporting new development have become increasingly worrisome to governments and residents of the study area. Because construction of multi-family housing depends on the availability of public sewers, their absence has curtailed residential construction. The lack of such facilities, for example, has constrained development in the suburban and urban towns of Southeastern Connecticut.

As sewer and water facilities become available in parts of suburban towns such as Colchester, East Lyme, Griswold, Ledyard, Montville, Sprague, Stonington and Waterford, public officials will be under increasing pressure to consider zoning changes permitting higher residential densities.

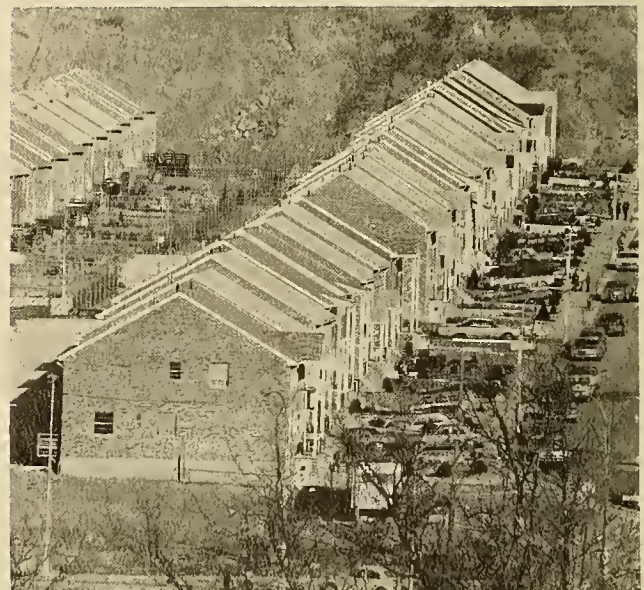
A public water supply system now serves towns along the west side of the Connecticut River and on the waterfront from Old Saybrook west to Clinton in subregion 2. These towns are concerned about the effect that introduction of a public

sewerage system would have on seasonal areas and vacant marginal lands. Conversion of seasonal homes to year-round use means the loss of a tax resource that previously did not require large expenditures for public services.

In Old Lyme, which has neither a public water or sewerage system, many residents fear that the introduction of public water will accelerate development and unleash uncontrolled growth. Present town-zoning policies reflect this view, and generally call for larger-lot zoning as the best way to avoid expenditures for public utilities and to preserve an open landscape.

Sewerage problems of some beach areas — in the town of Branford in South Central Connecticut, for example — have yet to be resolved. Adjacent to Limewood Beach in Branford is a former seasonal colony of mostly converted homes impinging on a tidal marsh. Without benefit of sewers, and with subdivision into small lots, conversion has created a significant (and all too typical) health problem that the State of Connecticut has directed the town to solve.

On the other side of the Sound, the Douglaston-Little Neck area in Queens also has problems with sewage and surface drainage. Studies of changes in drainage patterns caused by development of vacant land are now going on.



Douglaston is one of the most attractive residential areas in New York City and the only North Shore community in Queens that offers unrestricted access to its shoreline. But it has its pockets of pure "suburbia," too. Here, the anomaly of a typical subdivision in the middle of open space.

*The water supply systems in the area are described by subregion in *Water Supply Interim Report*. Point and non-point sources of pollution and federal, state and local programs to control water quality are discussed in the *Water Quality Interim Report*.

Wastewater Treatment

Conflicts have also arisen from proposed regional solutions to problems hitherto faced individually by towns. In Southwestern Connecticut, for example, the town of Norwalk opposes the State's recommendation for the location of a regional waste disposal plant in Norwalk. The town's 1973 Master Plan finds no evidence that the proposal will benefit Norwalk.

The dumping of industrial wastes has caused much criticism. Two years ago, the Army Corps of Engineers ordered Charles Pfizer Incorporated, to stop dumping mycelium, an organic by-product created in its manufacturing operations at Groton. The company attempted to solve the problem by selling the substance to a landscaping firm which was to convert it to topsoil by composting. Odors and possible water pollution from the composting operation led to protests from residents of the town of Griswold, and the State Health Department stopped the operations. Alternative proposals for disposal sites, however, have produced strong opposition among Groton residents. A long-range solution has yet to be found.

SHOREFRONT LAND USE

Throughout the study area, pockets of deteriorating seasonal housing pose a problem along the shoreline. Wading River faces such a problem, as do many towns on both the Connecticut and New York sides of the Sound.

In Southeastern Connecticut, a major issue is the use of the Thames River frontage for industrial expansion — as opposed to residential and recreational use. The subregion's largest industrial concentration is now at the mouth of the Thames in Groton. The General Dynamics Corporation is contemplating the expansion of its Electric Boat Division across the river into Waterford, and it seems likely that other industries requiring waterfront access will want to follow suit. The expansion plans of General Dynamics have drawn the fire of Waterford residents, and this may be only the first of many such confrontations.

Environmental Concern

In Greater Bridgeport, concern over the environmental impact of industrial development is evidenced in the controversy surrounding the Rykar Corporation's plans for industrial use of the Great Meadows in Stratford. Although the Rykar

proposal has been denied, Sikorsky Memorial Airport in Stratford has received permission from the Department of Environmental Protection to fill in part of its wetlands holdings. Plans now call for the Airport to be confined to its present property lines, but the possibility of the future runway extension to accommodate larger aircraft cannot be ruled out.

In Nassau County, along Manhasset Bay, oil terminals and shipyards now occupy part of the shoreline. Relocation or redevelopment, could transform these sites for housing and recreational use.

The thousand-acre sand pit area on Hempstead Harbor offers one of the greatest redevelopment possibilities within the Long Island Sound area in either Nassau or Suffolk Counties. Two private sand mining companies own most of the pit area. Nassau County also owns part of the area, and will eventually develop it as a park.

The pit area's accessibility to existing services and a large population suggests intensive future use of this land. On the other hand, difficult access imposes traffic limitations which, in turn, restrict the amount of commercial and industrial space that the area can accommodate. It is likely, however, that one-fourth of the land will probably be set aside for private commercial and industrial uses. The remainder of the shorefront and some of the interior is expected to be reclaimed for recreational purposes, while the rest of the interior is likely to be occupied by residential uses.

Roslyn has a high-density core consisting of a scenic and historic downtown area at the head of Hempstead Harbor. The harbor's redevelopment potential would depend on success in limiting or reducing the number of oil terminals and other commercial uses. Although a major incinerator exists on the west side of the harbor, this is not expected to deter conversion to commercial and nonindustrial uses.

Glen Cove is the only city that falls within the Long Island segment of the LIS study area. Several parks now provide public access to Long Island Sound, and further renewal of the waterfront area could expand public access.

The Port Jefferson area contains the largest commercial and industrial concentrations along the northern shoreline of Brookhaven Town. Although Port Jefferson Harbor now contains many commercial and industrial uses, it offers a number of redevelopment possibilities for recreational and



Aerial view of College Point on Northeast Queens peninsula. Shorefront area in foreground is one of many idle or underutilized waterfront properties now being considered for possible residential development by New York City's Department of City Planning. Closeup of this area (inset) shows rotted piling and other evidence of neglect.

residential development. The large LILCO (Long Island Lighting Company) generating plant and adjacent loading facilities are expected to remain on the harbor. The relocation of such uses as oil terminals, however, could increase public access to the water. Although Suffolk County is acquiring headlands around the harbor for public purposes, there is a general lack of major public access to the waterfront throughout the Port Jefferson area. Expansion of town-owned property at Mt. Sinai Harbor would be one way to provide for greater public access to the waterfront.

In Shoreham, the construction of a major power generating plant is creating the most significant land use change along the bluffs of Long Island Sound. A large parcel of waterfront land in Jamesport is planned for a power plant similar to the one presently under construction at Shoreham.

Greenport is trying to meet its housing problems

through a housing program, coupled with a proposed waterfront aquaseum. The aquaseum (a coined word suggesting a combination of an aquarium and a museum) will be developed by private interests with state and county assistance. The aquaseum development is intended to provide jobs, and New York State Urban Development Corporation funds will be used to underwrite a complementary housing and rehabilitation program.

Power Plants

Power plant siting is a problem whose solution at the local level is usually to "put it somewhere else"; utility companies, however, prefer shorefront sites because they afford easy access to cooling water, one of the most important factors in plant siting.* That same access is, obviously, also

*Existing generating facilities are listed in *Electric Power Generation*, an Interim Report, July 1973.

highly desirable for recreational use.

In Southeastern Connecticut, Millstone Point is already the site of two nuclear-powered electric generating plants. Millstone Point juts into Long Island Sound from the town of Waterford, and projected population growth in the study area makes additional expansion almost inevitable. Indeed, Northeast Utilities plans another power plant for the same area and foresees the need for at least one, or possibly two more in the future.

Understandably, the company would like to concentrate some of its generating capacity at one location because this permits operating economies. (Acquisition of another site in this area with such good access to cooling water would be difficult.) The potential environmental impact upon Long Island Sound of the thermal effluents from a cluster of such plants must, of course, be carefully examined. The acceptability of any impacts must be weighed in terms of any local or intensive effects as well as any potential subtle long-term effects upon the overall thermal characteristics of the Sound. The possibility of such changes, and the question of what would constitute other proper monitoring safeguards should be carefully evaluated by federal and state agencies in any future expansion.

In Subregion 3, South Central Connecticut, United Illuminating Company has acquired Charles Island as a power plant site. But the Island lies near the

site of a planned state park. This conjuncture of circumstances raises an obvious question: what is likely to be the effect of developing Charles Island as a power generating plant on the neighboring area's recreation potential. The possibility may exist of including a power plant as a integral part of a recreation complex. Such multiple use combinations have proven successful at other projects.

The Connecticut Light and Power Company, the only utility in Subregion 5 (Southwestern Connecticut) owning land on the coast holds property on Manresa Island in Norwalk, apparently for future expansion. The utility appears to be willing to discuss recreational use of its land north of the facility, but will retain ownership in any event.

Residents of Southwestern Connecticut have consistently opposed new power plant sites in the subregion. Purchase of Cockenoe Island, off Westport, by United Illuminating, for example, triggered public outcries resulting in the sale of the island to the Town of Westport. This and other pressures led to the formation of the State's Power Facilities Evaluation Council. On Long Island, the expansion plans of LILCO have generated similar controversy.

Dredge Spoil

Retention of certain industrial and recreational uses along the inner shoreline of harbors means that dredging is necessary to maintain channel depths.

In Southeastern Connecticut an issue that involves both the lower Thames River Estuary and the Sound is the planned expansion of naval activity in the Groton area.* To make the Naval Base at Groton usable for the largest classes of submarines, the Navy plans to dredge the Thames River channel from the river mouth to the Base. This, of course, raises a related issue — dredge spoil disposal. The Navy has proposed several locations for dumping large amounts of dredge spoil — the refuse material produced by underwater excavation — the most recent one being Long Island Sound, near the Race. The environmental effect of the spoil dumping is a highly controversial issue.

*In testimony before the Senate on July 7, 1970 concerning the future of Long Island Sound, John C. O'Brien, former Chairman of the Southeastern Connecticut Planning Agency remarked that "sewage from naval vessels moored in New London Harbor and the Thames River . . . makes exhortations from the Federal level (of government) to clean up our waters ring a bit hollow" *op. cit.* p. 61



Millstone nuclear power plant in Waterford, Conn. Although utility companies favor shorefront sites for economic reasons, such plant locations have created serious concern about the effects of thermal waste on the Sound.

And in southern Westchester County, U.S. Environmental Protection Agency standards on the concentration of toxic substances in dredge spoil have made it difficult to maintain present harbor facilities in southern Westchester County. EPA requires that dumping grounds be outside Long Island Sound, thus necessitating the use of ocean-going barges. Because barges of this size cannot negotiate the shallow harbors, some sort of transfer operation becomes necessary. The costs of such operations are prohibitive, and yet they must be met in order to maintain a recreational harbor. The possibility of joint municipal dredging operations is now under study as a way of reducing costs.

TRANSPORTATION

Historically, settlement occurred in the study area along its major transportation corridor originally the Sound itself. The corridor has since been augmented and intensified by Route 1, the Connecticut Turnpike, the Merritt Parkway and the railroad, on the Connecticut side, and by Routes 25 and 25A, the Long Island Expressway, the Northern State Parkway and the Long Island Railroad on the New York side.

The Connecticut Turnpike is never more than three miles from the shore, and the Merritt Parkway is

located three to four miles further inland. The major north-south arterials are U.S. 7 from Norwalk, Connecticut Route 8 from Bridgeport, I-91 and the Wilbur Cross Highway from New Haven. On Long Island, the major east-west highways (the LIE and the Northern State Parkway) are located more than six miles from the Sound, near the higher-density activities at the middle and southern side of the island. Routes 25 and 25A in New York provide east-west movement and serve areas north of the parkway-expressway corridor.

As urbanization increases, so do the needs to provide access to and within the developed areas. At the same time, developments in transportation spur urbanization. For example, the completion of I-95 in 1964 provided expanded and easier access to Eastern Connecticut and led to increased development in the area.

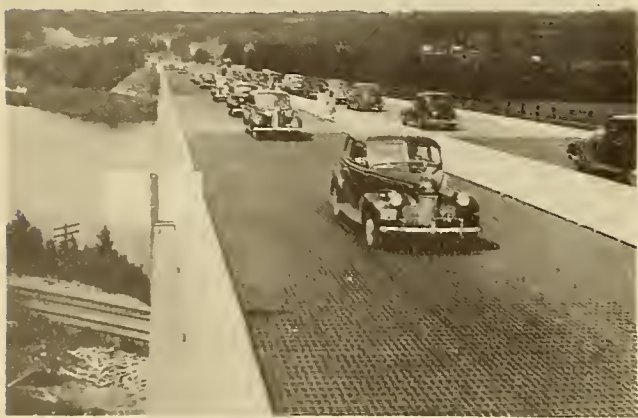
Continuation of dispersed population growth would entail still greater use of the automobile. A 1967 study done for the Greater Bridgeport Regional Planning Agency, indicated that if the private car were to continue to be the primary mode of transportation, it would be necessary to double the size of the Connecticut Turnpike.

Expansion plans for some roads in the study area have generated strong protest. Citizens groups oppose planned improvement of interchanges for the Merritt Parkway on esthetic grounds believing the Parkway should be designated as a Scenic Landmark. Similar controversy surrounds state expansion plans for Route 7, leading north through Norwalk and Wilton.

The emphasis in the region has been on the development of highways to handle increasing passenger and freight loads.* While there is little doubt that the region's extensive highway system is one of its greatest assets, the result of federal subsidization of highway construction is an obviously unbalanced transportation system. Highway assets are obvious, but the following liabilities must be examined:

Highway motor vehicles are a chief source of air

*Since World War II, private automobiles in Connecticut have made almost 90 percent of all intercity passenger trips (on a mileage basis). Freight is handled predominantly by truck fleets. Connecticut alone is annually turning over 7000 freight car loads to the trucking industry, which provides greater flexibility, convenience and shipping speed. (Richard C. Carpenter, *South Western Regional Planning Agency Statement*, March 8, 1974, p. 4).



The first traffic crosses the Housatonic River Bridge after the formal opening of the new Merritt Parkway Extension in 1940.

and noise pollution, and a major source of water pollution in metropolitan areas.

Highway transportation is one of the major expenditures of energy (second only to power generation).

Highways encourage haphazard development and subsequent congestion, and tend to be self-generating — more highways encouraging more cars and more cars encouraging more highways.

New highways and transSound bridges pose a threat to land that could be utilized more appropriately, and with greater benefit to the Sound ecosystem itself.

Abetted possibly by the energy crisis, pressures for improved mass transit systems and increased use of existing systems could affect future transportation patterns. There is renewed talk, for example, about a high-speed passenger railroad system between Boston, New York and Washington, a proposal that would have a major impact on the settlement pattern of the study area, as well as on the use of the area's recreational resources.

The integrated use of rail and motor freight can result in a more economically efficient system.



Amtrak's Metroliner, the high-speed (more than 100 miles an hour) train operating between Washington and New York seems to illustrate the kind of intercity transportation the Study area requires. One problem: while the subsidies that the federal government provides to operating railroads through Amtrak has increased ridership, they are more than offset by mounting operating costs.

Despite the outcry against the "prohibitive costs" of rehabilitating the existing railroad system, statistics suggest that about thirty times as much money is spent annually on highway construction.* In addition, it requires 3½ times more fuel to move a tone of goods by truck than by rail.**

Returning to the rails some of the freight now moved by trucks would strengthen the railroads financially, use scarce fuel more efficiently, diminish the need for expanding the highway system and facilitate more compact development. Since trains produce far less pollution, their revitalization would be a step in the direction of environmental protection.***

A similar system is feasible for passenger travel. Railroads could become the major commuting and intercity traffic mode, with buses and automobiles providing necessary access. Ultimately, rail rehabilitation and development — and a flourishing mass transportation system in general — can provide alternative modes of travel for those who do not own or cannot drive a car.

Studies of existing bus services suggest that an areawide density of about five housing units per acre is the lowest that can support local regular route service with at least an hourly frequency.**** This service might require a reasonable public subsidy. Even below this density, the potential for "on-demand" systems with flexible routes is promising. Concentration of residential development up to the "threshold" densities for one or another type of service is a plus for preserving and extending mass transit. By the same token, availability of such a system can encourage a concentration of services.

To reiterate, rails and highways were once highly

*Mary A. Frederick's testimony presented at the Interstate Commerce Commission hearing on *reorganization of the railroads of the Northeast and the Midwest*, March 12, 1974. (CITIZENS FOR SOUND PLANNING).

**George W. Brown, *The Freeway Failure*, 1972, p.4

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****Tri-State Regional Planning Commission

effective modes of transportation. Today, neither work at full efficiency. The goal of transportation planning should be to develop a more balanced system, with renewed emphasis on railroads and efficient bus service. Its achievement would help reduce adverse impacts on the environment, conserve scarce energy resources, and provide various and necessary services for a growing and diverse population.



NATURAL FEATURES AND RECREATION

Erosion, Sedimentation, Floods

Coastal erosion is a serious problem in the LIS study area, most of it occurring along the north shore of Long Island.* Indiscriminate construction on dunes and high bluffs as well as filling in of marshes have contributed to the natural damage

*The Erosion and Sedimentation Interim Report details the extent of coastal (and inland) erosion and sedimentation in the study area. Appendix B, Reference Table 5 contains selected coastal conditions by subregion.

caused by tides, storms, winds and waves. Sedimentation damages occur mainly in harbors where upland and marine sediment settles out of suspension and must be removed periodically to permit navigation of the channels.

Tidal flood damages are caused by "the forces of nature, the condition of the coastal area subjected to those forces, and the extent of human intervention." In some areas, such as the Westchester County shoreline, scattered damage occurs, while in others, such as the South Central Connecticut shoreline, "there were major damages . . . in every one of the seven coastal communities."*

Wetlands

In many ways, wetlands are the most critical natural features of the coastal area. They play an important role in marine productivity. According to one source, they represent "100,000 tons of potential plant material available to the coastal waters of LIS annually."** In addition, they provide the principal habitat for wildlife and for most of the marine animal species of the Sound during certain stages in their life cycle.*** Furthermore, wetlands figure significantly in trapping sediment, filtering pollution, and buffering inland areas from storm action and consequent flood damage. Although both Connecticut (1969) and New York (1973) have enacted legislation to protect these areas by requiring permits for activities in wetlands, surveillance and enforcement of the laws are a major task. Small fills, dumping or dredging continue to be highly detrimental to the system and difficult to monitor and control.

Conservation and Recreation Conflicts

The conservation of natural resources raises the question of protecting open space areas as well as providing adequate recreation areas and access to them. The two concerns are not necessarily complementary.

In the Connecticut River Estuary Area and in Greater Bridgeport, there is growing apprehension about the future of large tracts of open lands now

*The Flood Plains report generally identifies those areas subject to flooding and projects to mitigate damages.

**Wm. Niering, Tidal Wetlands of Long Island Sound: Their Ecological Role and Environmental Studies.

***The Ecological Studies Interim Report provides a general map of LISS area wetlands and also provides information on the fish and wildlife resources of the study area.

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*The Flood Plains report generally identifies those areas subject to flooding and projects to mitigate damages.

**Wm. Niering, *Tidal Wetlands of Long Island Sound: Their Ecological Role and Environmental Studies*.

***The Ecological Studies Interim Report provides a general map of LIS area wetlands and also provides information on the fish and wildlife resources of the study area.



NATURAL FEATURES AND RECREATION

Erosion, Sedimentation, Floods

Coastal erosion is a serious problem in the LIS study area, most of it occurring along the north shore of Long Island.* Indiscriminate construction on dunes and high bluffs as well as filling in of marshes have contributed to the natural damage

*The Erosion and Sedimentation Interim Report details the extent of coastal (and inland) erosion and sedimentation in the study area. Appendix B, Reference Table 5 contains selected coastal conditions by subregion.

being held for watershed protection and conflicts over conservation or development of these areas. At issue is the fear that economic pressures may result in a change of water company policy. Indeed in the New Haven metropolitan area, the New Haven Water Company recently did try to sell excess land for residential development. The Water Company now proposes to divest itself of some 16,000 acres but has publicly committed itself to sale to a public body, including the State as their first choice. Clinton and Killingworth, two towns within the Hammonasset River and the Menunketesuck River drainage basin, in the Estuary Planning Region, would be especially hard hit if the water companies place the 2,060 acres of open land that they control on the real estate market.

In some instances, conservation concerns are likely to clash with recreational needs along the shorefront. In Southwestern Connecticut, for example, conservationists regard Veterans Park as an area meriting preservation as a wetland. Although it is surrounded by water on three sides, the park has several well-used ball fields. The State's wetlands statute will probably help conservationists and undercut efforts to reclaim such land for more intensive recreation use.

Caumsett State Park, a large undeveloped park in Lloyd Harbor on Long Island, includes the old Marshall Field estate whose colonial manor house (Lloyd Manor) is an architectural landmark. New York State officials have warned of the need for careful planning and design to assure that development of the park does not destroy many beautiful buildings.

In Smithtown, major efforts are under way to acquire the remaining lands bordering the Nissequogue River and its tributaries for public use, thereby providing a continuous recreation and conservation belt. The limited-use Nissequogue River State Park would be the central point in this preservation area.

Preservation of wetlands and wildlife habitats is closely related to the quality of the water nourishing them. In Queens, for example, efforts to preserve Alley Park and Pond, and Udall's Cove in a natural state have resulted in greater popular concern about water quality. Balance in the tidal wetlands depends not only on the fresh water runoff bringing nutrients into the marsh, but also on the level of purity of the tidal flow. Any effort to increase recreational opportunities in the

western end of the Sound raises similar concern over water quality.

Future of the Islands

The eventual ownership and use of offshore islands — the Thimble Islands, Charles Island, the Norwalk Islands in Connecticut and David's Island, Hen Island and Hart Island in New York — is also the subject of considerable public debate.

On many occasions one or another of the Norwalk Islands has been offered for sale to state and local governments by their owners. Norwalk did acquire Ram (now Shea) Island. Despite efforts of the "Association to Save The Norwalk Islands," local groups such as the Taxpayers League in Norwalk have successfully opposed further local purchase of the islands. Sheffield Island is sandy with good boat access as is Chimons Island, but Chimons Island supports a heron rookery and should not be intensively developed for recreation.

David's Island in southern Westchester is now owned by the Consolidated Edison Company which planned to use the island as the site for several nuclear power plants. However, Con Ed is now interested in disposing of the property. While the island has considerable shoreline, it is rocky with a minor potential for beaches.

The 26-acre Hen Island (or Kuder Island) in Milton Harbor, south and southwest of Marshlands Park, is a potential nature preserve. It is now privately held, and has many small summer homes with



Current inhabitants of a unique heron rookery on Chimons Island are endangered by possible sale and development of the island.

access only by boat. The Westchester County Department of Planning has recommended the eventual acquisition and integration of Hen Island into the Marshlands Park system. The island has possibilities for wetlands monitoring or science education, but would be quite expensive to acquire.

Beach Access

Throughout the study area, beach facilities and access to them are serious problems.* The use of

beaches, even for town residents, is limited by availability of parking and, in some instances, by the small amount of public beach. The only saltwater swimming areas now open to the public in Southeastern Connecticut, for example, are the Rocky Neck State Park in East Lyme and Ocean Beach Park in New London. All other beaches are either restricted to local residents or are private. On summer weekends visitors from inland towns, especially Hartford, make Ocean Beach Park extremely crowded. The type of development



As one of only two saltwater beaches open to the public in Southeastern Connecticut, Ocean Beach in New London is a magnet for local residents as well as those sweltering in inland towns.

*BOR's Recreation Planning Aid Report No.3 lists by subregion all existing recreation facilities in the study area, while the Recreation Interim Report summarizes supply and demand for beach swimming, boating, picnicking and camping.

The Shoreline Appearance and Design Work Group has analyzed the LIS shoreline looking from the sea to the land and the views and viewpoints from land seaward. An inventory of historic sites (nearly 1,300 sites and structures) was prepared and the Interim Report, *Scenic and Cultural Resources*, lists the most important underrecognized or threatened cultural sites in the area as designated by the regional planning agencies.

likely to occur at Bluff Point State Park in Groton may not relieve this pressure substantially. The matter of access roads and the facilities to be constructed will have to be closely related to the needs to preserve environmental quality and natural resource values. The projected population increase in Southeastern Connecticut (and inland areas) will create demands that neither municipal beaches nor state parks will be able to satisfy.

Facilities for recreational boating in the study area are under similar pressures. While there is still room for expansion of pier facilities in Southeastern Connecticut, land for new marinas is hard to acquire. The fact that large numbers of boat owners come from inland places beyond this subregion, promises to make demand eclipse supply very soon. Local residents are likely to view such a situation with alarm. The possibilities for increasing boat access in the area include fewer but larger marinas in the more suitable harbors and more efficient use of existing facilities.

Agricultural and Forest Lands

Agricultural land use in the LIS study area has been steadily declining. Economic competition from large farms in the Midwest has been a major contributing factor in eliminating marginal farms, as have the pressures of urbanization. The conversion of farm land to urban development has been occurring throughout the study area. Indirect pressures from rising taxes and increasing costs of farm operations have also influenced agricultural land conversion. Connecticut's Governor's Task Force for the Preservation of Agricultural Land is now studying ways to preserve Connecticut's farmland (from 1964 - 1974 the state lost more than a quarter million acres of farmland.)

Larger farms with prime agricultural land have a better chance to survive than do farms on poorer soils. The better agricultural lands, however, are also the most desirable lands for development. Since the soil surveys necessary to identify the extent and location of the most important agricultural and forest lands are not available for all of LIS study area, a general evaluation of the importance of agricultural, forest, and grasslands was made by the U.S. Department of Agriculture. The following discussion has been adapted from their report.*

Water Supply

Open fields and woodlands serve as a filter of water, purifying surface water and assisting in the recharge of underground aquifers. Plant communities found on agricultural and forest lands provide the needed cover and binding effects that control soil erosion from runoff and the resulting sedimentation affecting critical ecosystems (wetlands, ponds, lakes, and streams). Runoff from

urban areas, uncontrolled by vegetative cover is one of the major sources of pollution in the Sound, and also one of the most troublesome as it cannot be traced back to an identifiable source.

Open Space/Recreation

Prime agricultural land maintained as open space conserves the soil, one of our most important natural resources. It provides space for nature study and scenic views. Forest and agricultural lands also provide opportunities for multiple recreation use. The uses may include hiking, hunting, fishing, trailriding, snowmobiling, ice skating, and bird watching. Indeed, these areas may be the major untapped recreational resources needed to meet the rising demands of the future.

Farm Production

Farms with their row crops, pastures, orchards and woodlands are irreplaceable assets and should, to



This area north of Commack was once productive farmland.

the extent feasible be maintained in agricultural production. Although locally produced farm products furnish only a small portion of needed foodstuffs, these products are popular in local markets. It is likely that any reduction in farm production will have a direct impact on local food costs.

* U. S. D. A. *Planning Aid: The Role of Agriculture and Forest Land in the Long Island Sound Area*, April 1974.

Wildlife Habitat

The farms of the study area furnish a wide variety of wildlife habitat. The open fields, woodlands, and wetlands which are part of most farms constitute the widest range of habitat conditions. The amount of publicly owned land that can be considered good habitat is very limited in proportion to privately owned land. The future for assuring good wildlife habitat depends, therefore, on the continued existence of farms and other privately owned open lands. Prime agricultural land is not only economically productive, but is especially beneficial to wildlife, providing food and cover for birds and mammals.

Pollution Control

With its growing crops, farming activities also act to filter air impurities. Woodlands and other crops can act as a buffer to reduce the impact of noise from urban sources. When located, for example, between urban areas and transportation and power transmission line corridors, the mere presence of these lands can eliminate some of the undesirable sights and sounds associated with urbanization and high speed travel.

Natural Resource Map

The natural resource map included in this report (Map 5) identifies prime agricultural and forest lands, and includes cropland, hayland, pasture land and woodland. This "prime agricultural land" consists primarily of soils that are deep or moderately deep to bedrock and generally well drained. Lands that are physically fragile and unstable, such as the high-sloped forest lands, are also included on the map. Consequently, the general categories which were mapped are: agricultural land on slopes of 0 to 8 percent; grassland on slopes of 8 to 25 percent and forest lands on steep slopes or on prime soils.

While detailed figures are not available, the U. S. Department of Agriculture, Soil Conservation Service has provided an estimate of prime agricultural land in the study area — 82,500 acres in Connecticut and 4,500 in New York.*

Streambelt Corridors

Agricultural and forest lands are more than sites on which to erect buildings. They represent potential production of food and wood fiber, recreation and wildlife. They are also watersheds, open spaces, and natural areas. Because many land-use decisions

tend to be irrevocable, restoration of misused lands will take decades to accomplish if it is indeed possible at all.

Urbanization poses a potential threat not only to the natural resources found in the agricultural, grass, and farm areas, but also to the many streams that flow through them. The quality of the environment of the LIS study area is linked to a great degree, to these streams and their associated lands. These areas are mainly composed of the water course of a defined stream, (including banks, bed, and water); the lands subject to stream overflow; associated wetlands; shorelines of lakes and ponds associated with the stream; and areas near streams that would probably be adversely affected by development.

Additional components of such "streambelt environmental corridors" could include contiguous lands with special environmental values, significant potential water supply development sites, and the agricultural, grass, and forest lands linking corridors into a streambelt system.

In order to delineate a streambelt system, detailed inventory data at the local level must first be compiled to locate, identify and evaluate various land and water resources such as floodplains, reservoirs, aquifers, critical erosion areas, and soil characteristics. Geological, conservation and soil surveys can supply such data and local conservation commissions could coordinate data compilation.

Soil and water conservation districts can implement public information programs to stimulate public concern and to promote participation in conservation activities in the streambelt program. A town should then be able to produce plans incorporating its objectives for use and preservation of the streambelts. Special regulations should be implemented for the key elements in streambelt corridor. The adjoining areas — where special land-use controls may be neither practical nor justifiable — should be planned to make the fullest possible use of open space.

Throughout the LIS study area, there is evidence of irreversible destruction of streambelts. The identification of these environmental corridors and appropriate decisions on managing and implementing a streambelt system can enhance the area for maximum human use and enjoyment while preserving and protecting ecological balances.

*"Prime Agricultural Land" a memo prepared by the U. S. Department of Agriculture, Soil Conservation Service, May 24, 1973.

Map 5

NATURAL RESOURCES

This map shows a general inventory of natural resources of the study region in five categories: publicly owned open space (including parks, state forests, and open land), water utility owned land, water, wetlands, and lastly prime forest land, prime agriculture land, slopes $\geq 25\%$, and floodplains.



MAP 5
NATURAL RESOURCES
LONG ISLAND SOUND REGIONAL STUDY

-  PUBLICLY OWNED OPEN SPACE
-  WATER UTILITY OWNED LAND
-  WETLANDS
-  PRIME FOREST LAND, PRIME AGRICULTURAL LAND, SLOPES 25%, FLOODPLAINS

SOURCE: NEW ENGLAND RIVER BASINS COMMISSION
SCALE: 1 INCH = 8 MILES 1:500,000 approx

PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT



5: PLAN FORMULATION

GOALS

The goal of the Long Island Sound Regional Study is to devise a plan that protects, conserves and provides for the wise development of the Sound and its related shorelands.

The Land Use Work Group has restated the Study's overall goal to apply more directly to the Work Group's primary area of concern. Its goals, as incorporated in the Land Use Management Plan are:

1. To promote the wise use of land resources, particularly those limited areas whose locational or other characteristics make them suitable for moderate- or high-intensity urban use or for remaining open, either as undisturbed natural areas or as prime farm or forest land;
2. To improve the quality of daily life for the study area's diverse population by widening residential choice and increasing access to the unique amenities of the Sound area;

A complementary goal related to the role of the Work Group in the overall study effort is:

3. To devise alternative strategies that can serve the New England River Basins Commission as a policy guide in fashioning achievable plans for the entire LIS study area.

Wise Use of Land Resources

Many of the problems identified in Chapter 4 stem from a lack of recognition of the value of land resources, leading to a pattern of imprudent or

inappropriate use of land, particularly along the Sound and its tributary waterways. Protecting the special resources unique to the study area, is one way to ensure that land is more wisely used in the future. Regulations can be used to prohibit intensive development from designated stream belts or flood plains, for example, while, at the same time, a wide range of incentives can be adopted to encourage recreational uses in these same areas.

Sustained development pressures, however, can make it increasingly difficult to enforce regulatory measures aimed at long-range protection of the available land supply. A reduced tax assessment on agricultural land, for example, may merely allow the farmer a tax break while he waits for the developer's best price on his land. Hence, wiser use of land resources means not only protecting the available supply but also pursuing policies that effectively reduce development pressures on open land resources.

Reducing pressures on the supply of undeveloped land means decreasing the demand for urbanization. One way to do this is to pursue a no-growth policy. A more acceptable way is to encourage vigorously the development of strong urban centers where more persons occupy less land. If the protection of high-contribution open spaces is to be a real and not a phantom policy, then development will have to be consciously directed away from those areas where urban use would, at best, be inappropriate or, at worst, damaging to the environment.

Improved Quality of Daily Life

In the context of the Sound region, an important

way to improve the quality of daily life is to make the amenities of the study area more accessible to those who, because of income or location cannot enjoy the privileges that residence in a locality along the Sound now affords. (Appendix B, Reference Table VI and Map 8). This could involve a wide range of actions, including the relatively simple step of facilitating transportation to recreation areas along the water during peak periods of demand.

OBJECTIVES

Achievement of the above goals, then, depends on:

- Protecting special opportunity areas;
- Reducing urban development pressures;
- Increasing opportunities for access to the Sound.

While it is possible to devise a plan which incorporates only one of these objectives, it is the consensus of the Work Group that the recommended management plan must reflect all three objectives if its goals, as well as the overall goal of the study, are to be realized.

In evaluating how alternative measures contribute to the fulfillment of these goals and objectives, all Work Groups used three criteria, established by the U. S. Water Resources Council — Environmental Quality, National Economic Development, and Social Well-Being. Pages 49 through 51 of the following section of this report elaborate on the use of these criteria.

MEASURES

To indicate how goals and objectives are to be realized the Work Group has put forward a number implementing measures.

MEASURES TO PROTECT THE SUPPLY OF SPECIAL OPPORTUNITY AREAS

To Prevent Needless Encroachment of Inappropriate Uses

1. Establish Protective Regulations

The most straightforward way, short of acquisition, to protect special opportunity areas

is to adopt and enforce regulations prohibiting inconsistent use. There is a growing precedent for regulatory action of this kind, at both state and local levels.

One objection to this approach is that it acts to drive up development costs either by reducing the available land supply or by forcing development into other areas that are less accessible or otherwise more expensive to develop. The seriousness of this objection is likely to hinge on:

- The amount of land restricted relative to demand;
- The location of the restricted land;
- Its suitability for development in the absence of restrictions.

A more widespread objection to regulatory restrictions, however, is essentially legal and institutional, focusing on the plight of the regulated landowner. If the owner's loss, as a result of regulation, is perceived as small in relation to the public gain, prohibitions are most likely to find favor.

The effect on the individual landowner of regulations which produce economic "wipeouts" may be offset by taxes on economic "windfalls." Such balancing is based on the assumption that the landowner is benefitting, or suffering, from government or community action. One such trade-off involves the transfer of development rights — a landowner whose right to develop a land area has been restricted, may transfer that development right to another section of land and develop it beyond the level ordinarily permitted.

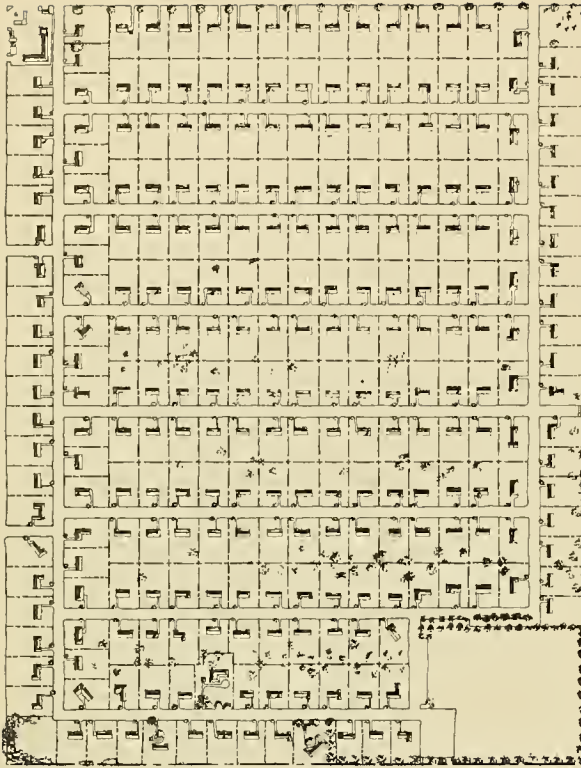
2. Increase Public Awareness of Benefits

One way to increase acceptability of protective regulations is to sharpen public awareness of the benefits that the regulations confer. Popular sensitivity to the biological importance of wetlands, for example, has generated protective restrictions that were unacceptable to most legislators a decade ago. Awareness of hurricane dangers increases receptivity to restrictions on floodable areas. Like the current energy shortage, such forces create special opportunities for action, and public officials should seize them as they arise.

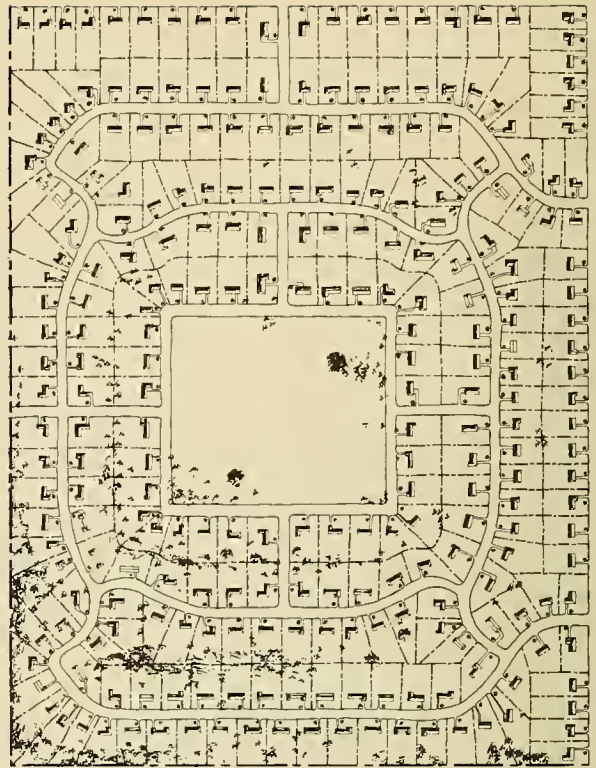
A corollary of this is the need for narrowly



This pastoral-looking area was once considered as the permanent site of the United Nations. No, it doesn't look quite like this anymore. Scene is Greenwich, Conn. in 1946, and the center of the area also includes parts of Stamford, Conn.



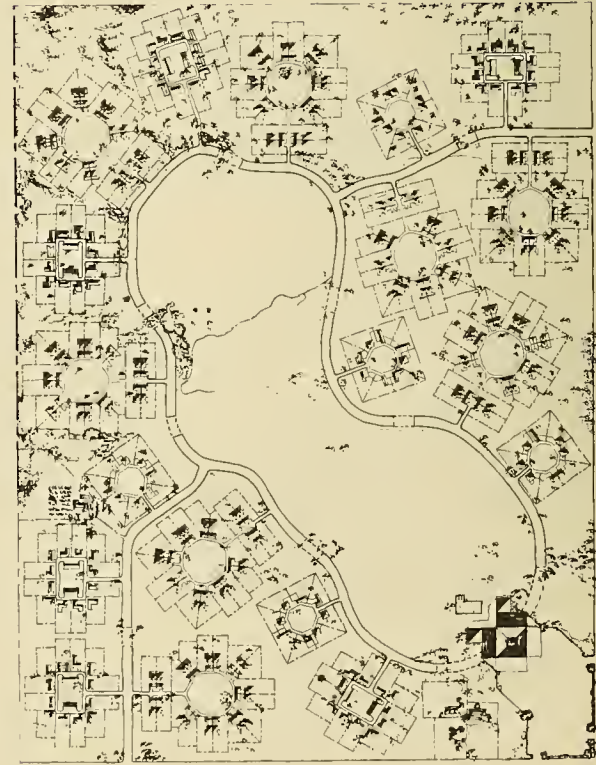
RECTILINEAR



CURVILINEAR



CLUSTER



PUD

The same number of units are accommodated in each quarter. Moving away from a conventional grid arrangement of houses allows greater respect for the natural characteristics of the site and greater diversity of housing type.

focussed campaigns aimed at legislators. Such "single issue" efforts ("save the islands" or "defeat the bridge") directed at a particular problem in a particular locality, can have a far-reaching impact, particularly when it has been preceded by other available measures such as education and publicity. Public participation in plan formulation can be a decisive vehicle in this regard.

3. Reduce the Landowner's Loss through Cash Compensation

Still another way to strengthen protective regulations is to reduce the financial loss that they impose on landowners. Cash compensation is one commonly proposed measure to reduce landowner's losses, but, in addition to lump-sum or annual payments of cash grants by government, compensation could also take the form of reductions in the owner's tax payments.

The event entitling an owner to compensation could be simply the imposition of zoning, the signing of a contract by the landowner, or the transfer to government of some ownership interest in the land. These actions could be initiated by a local government, by a state or other government, or by the landowner.

Although compensation would overcome some objections to protective regulations, compensation measures are themselves subject to both economic and social objections. One set of objections is fundamentally administrative, and includes concern about the difficulties of:

- Distinguishing compensable from noncompensable regulations
- Fixing the amount of compensation
- Assuring that the compensated landowner would be effectively prevented from obtaining later relaxation of the regulations.

Another set of objections to cash compensation is both economic and administrative. Even limited application of a compensation principle could be costly to governments and taxpayers. Its broad extension, perhaps to cover many restrictions that are now applied without compensation could vastly increase public costs.

It is unclear whether governments would simply meet the increased costs, retreat from the

compensation principle, or relax restrictions to avoid paying compensation.

4. Reduce the Landowner's Loss through Use of the Cluster Principle

In an age where spreading cities consume enormous amounts of land, clustering not only can reduce the private loss attributable to protective regulations, but can, by consuming less land, serve a major public need.

Instead of requiring a landowner to spread development evenly over meadow and wetland alike, the cluster principle permits the concentration of dwelling units on a portion of his land.

By clustering housing units, the builder has fewer streets, sidewalks and utilities to install, less contracting of material and equipment, and reduced site clearance requirements. He can build one cluster at a time, and this concentration of materials and equipment in one location can mean a considerable savings in man-hours and convenience. The savings that accrue from the built-in flexibility of clustering can be passed on to the consumer in the form of lower initial costs.

Clustering houses around common open space also reintroduces the design tradition of early New England towns. Greater housing variety can be provided on less land than the present pattern of single-family detached homes requires. This strengthens the possibilities for maintaining environmental quality, insofar as it is used to retain sensitive areas as open space. Through site review (submission of a site plan would be a condition for approval), a locality could be sure that site design conforms to environmental guidelines. The retention of open space permits a developer greater flexibility in his site design and, indeed, it may be useful to consider giving him a bonus in increased density allowance if the site plan adequately protects some key natural resource from degradation. The expansion of the PUD idea could be extended to include required ratios of open space to density and of paved surfaces to gross site area (to reduce runoff).

5. Use Large Lot Zoning in Selected Areas

This involves designating areas considered valuable for their natural resources, open space or agricultural potential, and may call for very

low-density single family and agricultural use. This approach is particularly appropriate for areas that are difficult to serve with public water and sewer, at least in the near future. Because of the absence of utilities, high-density development of such areas would be environmentally damaging.

While large-lot zoning (two acres or more) may be environmentally sound in particularly fragile environments, it results in an incredibly inefficient use of land through scattered development. It may also, though not necessarily, be a form of exclusionary zoning disguised as environmental protection.

To Facilitate and Encourage the Best Use of Special Opportunity Areas

1. Reduce the Private Costs of "Best Use" through Taxation

"Environmentally sensitive" taxation to control the timing and location of development could be related to the establishment of agricultural and conservation zones. Agricultural zoning is used to encourage continuing use of lands best suited for agricultural production.

Too often, development pressure in urban fringe areas raises the price of agricultural lands, making agriculture uneconomical. As a result, prime farmland is often sold to speculators or real estate developers.

In keeping with a "best suitability" doctrine, agricultural zoning seeks to delay or prevent conversion to inappropriate urban use, but it should apply only to prime agriculture land. (Agricultural soil suitability maps from the Soil Conservation Service can provide the necessary data.) A difficulty in effecting this measure is resistance by landowners to zoning that would prevent sale of their land at urban market prices. Reduced tax assessments can somewhat reduce — but not eliminate — the economic consequences to the owner.

Another possible alternative to prevent development on lands unsuitable for urban use is the establishment of conservation zones to protect areas whose alteration would cause health problems or environmental deterioration. Such a protection policy depends on reinforcement by appropriate tax assessment and public investment policies. Because the rezoning of a conservation district by one municipality can be

detrimental to its neighbors, such zoning should be supported by all affected localities. The Conservation Zone or Natural Resource District also attempts to assure adequate areas for future conservation, recreation and certain agricultural pursuits. It can also include areas preserved as common open space in PUD's, as links in a larger open space system.

For areas highly sensitive to adverse impacts from development, a number of more specific, conservation oriented, zoning ordinances have recently been developed: Flood plain zoning; coastal plain zoning; wetlands zoning; stream bank zoning; shoreland zoning; and steep slope zoning. Often, any construction in environmentally sensitive areas requires a special permit.

This is true, too, for types of development with a high potential impact on surrounding development. Special use permits allow for a greater degree of detail and flexibility in controlling the quality of development and its impact on a specific environment.

Although there are many difficulties attached to the method, environmental performance standards have been proposed as one way of determining what uses should be allowed in certain areas. A level of output (range of water table, for example) is defined for a certain area (in this case an aquifer recharge area). Regulations would be drawn to protect the desired performance level and any proposed use is then evaluated in terms of its effect on the performance standard. In this way, what is important in a natural system is looked at, rather than simply the impacts of pollutants on the system.

Several states have laws requiring the assessment of land at fair market value based on its existing use (e.g., agriculture, conservation) rather than on its potential value for urban uses. A governmental unit may also purchase development rights,* or grant tax abatement or tax deferral for owners of agriculture-conservation land. But preferential tax assessments must be accompanied by a long-range commitment to keep conservation or agricultural lands beyond the reach of the speculative developer. There are now laws, for example, that permit property

*When a government buys development rights, the landowner is left with title to the land but not the right to build a housing development on it or to pave it over for a parking lot.

owners to cede voluntary easements or restrictive covenants on the land to government.

Modification of this approach vary by level of government and state. To date, however, tax abatement or tax deferral is mainly a holding measure; it does not permanently protect, but does buy time.

2. Increase Private Profit from “Best Use” through Protecting the Private Market and through Loans or Subsidies

Loans and subsidies to the private landowner could be used either to encourage the right type of development or to reward the owner for not developing at all.

If certain uses are deemed most appropriate for a particular area — marina development, for example — subsidized public facilities should not undercut private development. Where a need is perceived, every means should be made to get the private sector to respond, thereby conserving more limited public resources.

3. Acquire Land through Purchases

For activities requiring public access (recreation) as well as for activities having large or unique site requirements (power plants), fee simple acquisition is undoubtedly the most direct but also the costliest measure. Because of the high costs involved, a public land acquisition program should be used sparingly, in concert with other measures, and for sites strategically located to provide the greatest public benefit. In many cases, this may require acquisition plans based on advanced designations of appropriate location for specific types of development or use.

MEASURES TO REDUCE DEVELOPMENT PRESSURES

To Reduce Urban Land Demand, and to Guide the Location of Urban Development

1. Public Facilities Planning and Investment

The role of public utilities and transportation systems in shaping urban growth underscores the need for using public investment to control the location, type, size and timing of such development. The location of major highways, and highway improvements are major determinants of urban growth patterns, followed in importance by the location of trunk sewer lines and, to a somewhat lesser extent, the location of

trunk water mains. If development is to be effectively directed within the LIS study area, an explicit policy or plan should guide public investment, indicating both the desired location of new urbanization and the desired sequence of development.

Such a strategy would prohibit extension of sewer systems into environmentally critical areas where development should not occur — flood plains, major groundwater recharge areas, and places designated for open space or resource management uses. Even with purposeful guidance of public investment, however, both developed and newly developing areas are encountering problems.

One problem stems from the fact that the services now being provided meet a need that has arisen from past and current development. Until all existing needs and problems are met, it might be difficult to use utility extension policies to consciously shape development with any great degree of effectiveness. A second problem involves coordination. Unless government actions are supplemented by other policy measures, it is difficult, for example, to have adequate control over the construction of private sanitary sewer systems in the urban-rural fringe. It is difficult, also, to achieve effective coordination of the policies and programs of different functions — such as highways and sanitary sewers.

If future development patterns in the Sound area are to enhance the quality of life, coordinated public investment measures will have to play a more effective role with respect to transportation, community facilities programming, housing, renewal and redevelopment, industrial park location and open space acquisition. And if public investments are to serve as an effective implementation device for guiding future land development patterns, it will be necessary to define a strategy in some detail, both with respect to the location and timing of development.

2. Requirements for Environmental Impact Statements

One approach to site control is to require developers to submit an environmental impact analysis on the proposed development. Although impact statements are presently limited to disclosure requirements only, they tend to increase developer awareness and concern about



Existing waterfront development in Westchester County precludes access to beach.



Redesigned with a mix of residential types, more open space is available.



Clustering the units allows maximum access to the beach and other open space areas.

the environmental consequences of their projects.

The Environmental Impact Statement does provide a channel — through public review — for public officials to apply pressure on a developer to maintain environmental quality.

The EIS analysis and inventory could be extended beyond the public disclosure stage and incorporated as a part of a regulatory measure.

A development permit (subdivision, PUD, etc.) might not be issued, for example, unless the EIS assured minimal impact on the environment and on public facilities and conformed to an over-all plan (assuming one existed).

3. Increase the Density of Urban Development

Direct assistance to large-scale, medium and high-density development could include, for example, more liberal financing and assistance to developers in assembling land for projects of 500 units or more. Such assistance could be contingent on design plans that meet criteria for a mix of housing types and rental levels. In addition, regulatory measures could be used that would replace low-density lot requirements with minimum density area requirements.

Governments should actively encourage improved urban design and management to provide a better alternative than either the typical suburban subdivision or the usual highrise apartment building associated with the central urban core.

Direct support for and assistance to mass transportation, with moderate and high-density development at major transportation points or interchanges, should be a matter of the highest priority at all levels of government in the LIS study area.

MEASURES TO INCREASE OPPORTUNITIES FOR ACCESS TO AMENITIES OF LONG ISLAND SOUND AREA

1. Facilitate Legal Access to Amenities through State or Federal Legislative Action

Because local governments have traditionally borne the responsibility for adopting and applying regulations, critics of ineffective regulations often propose action by state, regional, or federal governments. Their claims may be summarized as follows:

- The presence of relatively few governments above the local level, means that efforts to create awareness of problems can be concentrated on fewer legislators and administrators;
- Local governments, responsible only to their own resident voters, too often take actions that harm residents of other communities, while higher levels of government must respond to much larger constituencies.
- Federal and state governments are more likely to have the money and manpower needed to implement more expensive and more sophisticated regulations.

Most objections to higher-level action have to do almost entirely with legal or institutional concerns. Many persons believe that federal and state governments, while responsible to a larger electorate, are less responsive to the needs of individual citizens than local governments. Although many acknowledge that larger budgets, staffs, and geographical jurisdictions increase the probability of effective response to some problems, they go on to assert that this in itself is no assurance that a higher level of government will, in fact, be more effective than local government in responding to a particular problem.

Perhaps the most vigorously voiced objections to higher-level action come when residents of privileged localities fear dilution of their privileges. The quality of their lives, they fear, may be lessened by measures intended to improve the lives of others elsewhere. Some higher-level actions are not subject to these objections (e.g., state protection of wetlands), and their acceptance is accordingly greater than acceptance of other actions (e.g., provision of high-density housing sites or increased access to municipal recreation areas).

Since privileged communities occupy much of the land in the LISS region*, including the land that is likely to accommodate most future population increases, and future recreational demand, means for overcoming objections of their residents are critical to the area's future. These legal measures can be divided into two categories.

- Those reducing the ability of the communities

to prevent needed change (e.g., court decrees or statutes limiting local restrictions);

- Those reducing the desire of the communities to prevent needed change (for example, the measures taken within the Cape Cod National Seashore area which open many beaches to the general public, but reserve others for local residents).

2. Increase Amenity Supply

a. Public acquisition of private holdings having high potential recreation use

Among the most likely candidate areas for public acquisition are private country clubs, estate areas, and institutional holdings adjacent to or readily accessible to Long Island Sound. Because these sites usually come on the market with little advance notice, local and state governments should conduct an inventory of such potential acquisition sites at the earliest opportunity to be in a position to move quickly to purchase such areas as they become available.

A second category of private holdings with high potential for recreational use are some of the off-shore islands, such as Sheffield Island in Southwest Connecticut. A number of these islands represent unique and irreplaceable resources and deserve high priority for early public acquisition. Chimons Island, for example, has a heron rookery and for that reason should not be developed for intensive active recreational uses.

A third category of private holdings covers deteriorated developed areas along urban waterfronts as well as substandard summer cottage developments along barrier beaches, many of which are also adjacent to tidal wetlands. In both cases, governments, by utilizing the renewal process could acquire these sites for redevelopment as public recreation areas.

b. Develop areas already in public ownership but which have not been developed for public use

In a number of cases, publicly owned park sites have not been developed for recreational use because of the absence of adequate funds or fear of adverse impact on surrounding development. Among the more outstanding cases are Bluff Point State Park in Groton, Connecticut, Caumsett State Park in Lloyd Harbor, and Ferry Point Park in New York

* See Appendix B, Reference Table 6

City. The latter is a 300 acre site of which only about one-fourth is developed for recreational use. An additional example is Playland in Westchester — a county-owned amusement park adjacent to the Sound, with more than 100 acres which remain undeveloped for recreational use. Fort Totten, in the western portion of the Sound, is currently used for limited public purposes (Job Corps Training Center) but could be developed for a wide range of intensive recreational activities.

3. Facilitate Access to Supply of High-Amenity Areas by Improved Public Transportation

With the advent of high-speed rail transportation (and recently instituted reduced weekend fares) the residents of the study area could have access

to a wide range of recreational facilities along the Long Island and Connecticut portions of the Sound as well as to those in Rhode Island. Supported by expanded ferry service, access could be substantially improved for day trips as well as weekend excursions. To take advantage of these opportunities and to reduce the need for automobile and associated parking, local bus service could be provided from rail termini to recreational sites and ferry locations.

The town of Greenwich has operated a recreational ferry from Greenwich to Little Captain Island for a number of years. Westport has recently instituted a "minibus" system, servicing even the lower density sections of the town.



Access to Little Captain Island is provided by a financially self-sustaining recreational ferry from the town of Greenwich.

6: ALTERNATIVE STRATEGIES

Since this is a region-wide, Sound-oriented study, detailed land-use recommendations for the study area would be inappropriate. Such planning is the proper responsibility of regional, county, or local planning agencies and, as indicated in previous chapters, considerable general planning activities are underway at all levels of government. The emphasis, therefore, has been on devising policies and programs requiring basinwide action, oriented toward water and related land resources, with primary attention focused on those areas next to the Sound itself.

Five elements have been considered in devising alternative management strategies. They are:

1. Goals and objectives;
2. Measures to achieve the goals and objectives;
3. Planning subareas or geographical units among which policy emphasis will differ;
4. Density or development patterns that may occur within the planning subareas;
5. Criteria for evaluating both the measures and development patterns.

Since the preceding chapter has set forth goals, objectives, and measures, this chapter will define planning subareas, development patterns and criteria. In addition, it will evaluate development patterns and measures relative to the criteria.

PLANNING SUBAREAS

For purposes of developing alternative management strategies, the study area was divided into

three planning subareas reflecting different degrees of orientation to the water.

Maritime Edge

The Maritime Edge consists of the places where land and water meet, as well as the areas immediately adjacent to the shore. It would include any of the following unique natural areas — dunes, bluffs, scenic vistas, self-sustaining biotic communities and ecosystems such as wetlands; and areas of direct salt water land interaction, as defined by hydrological or ecological conditions or relationships. Edge conditions would have to be accurately defined by Work Groups concerned with sources and movements of water, and fish and wildlife.

Coastal Sector

The Coastal Sector has been tentatively delineated by discussions with the Regional Planning Agencies. Boundaries generally follow Interstate 95 and the Boston Post Road in Connecticut and Route 25A on Long Island. These roads are the principal physical barriers or dividers between near-shore and uplands, beyond which bicycling or walking to the shore is unlikely.

Interior Upland

The Interior Uplands constitute the remainder of the Long Island Sound drainage area beyond the Coastal Sector.

DEVELOPMENT PATTERNS

Earlier sections of this report examined existing development patterns in the study area, and

established that urban growth in the LIS study area, as in the rest of the country, has been characterized by a continuing trend toward increased per capita consumption of land. There are reasons for this: larger individual lot sizes, increasing automobile use, rising demands for public recreation, summer home development, larger sites for industry, airports, shopping centers, decentralized college campuses and campus-like office centers in rural settings.

Although some counter trends are appearing, the single family home dominates the suburban landscape. The great expanse of urbanized areas consists of small structures and minispaces. There is little to indicate that any sharp departure from this pattern will occur without strong and conscious public action. The prospect of a 54 percent increase in the population of the LIS study area between 1970 and 2020 simply as an extension of the present suburbanizing pattern may be expected to increase the multiple problems now confronting many of the counties, towns and cities within the study area.

Increased Dispersal

The possibility of this pattern occurring would imply an increasing rate of decentralization at low gross densities between 1,000 to 2,500 persons per square mile.* Such a possibility implies:

- Continued reliance on the automobile as the dominant form of transportation; little technological improvement in mass transportation; longer journey to work;
- Continued reliance on large-lot zoning and other regulations whose effect is to accentuate the low-density living patterns encouraged by automobiles;
- Continued confinement of most low-and moderate-income families in urban core areas because the present pattern of single-family homes on large lots is beyond their economic "reach" and, in some instances, may also be an undesired life style;
- Continued dispersed and underorganized pattern of land development resulting in a weakening of the distinctions between "town" and "country" or rural and urban environments; probable

conversion of private open space (country clubs, estates, etc.) to more intensive use;

- Virtual demise of commercial agriculture except for exceptionally high-value truck gardening, nurseries and greenhouses.

Present Patterns Projected

The change in the demographic characteristics of the study area (i.e., smaller families, an aging population and higher incomes), as well as more leisure time, and increasing support for public mass transportation, may induce a future pattern of growth that is more balanced between single family home development and multiple family housing.

Such a growth pattern, at a density of between 2,500 to 3,500 persons per square mile, is not necessarily inconsistent with the objective of protecting critical natural areas.

New York and Connecticut have already adopted a number of regulatory measures for achieving this objective — wetlands preservation, for example. The larger question of how vigorously the states and localities will implement such measures remains to be seen.

It is possible to protect selected high-priority, natural areas without any radical alteration in present public policies. In addition to identifying and taking measures to protect these areas, future growth based on past development trends would probably imply the following:

- Continued dependence on the automobile, but with limited improvements in public mass transportation;
- Selective relaxation of zoning prohibitions against multiple-family housing to promote some degree of concentration;
- Greater use of new site planning techniques, including clustering and planned unit development;
- Designation and advance acquisition of sites for regional support facilities;
- Continuation of current central city renewal, though at reduced rates because of the absence of direct federal support for such programs;
- Possibility of limited new towns or large planned developments, but at a rate and scale that would have very limited regionwide impact.

In general, the major opportunity for public

*Appendix B, Reference Table VII indicates the additional developed land areas which would be required under each of the density patterns discussed.

actions will occur on a selective, local basis and for specific reasons. It may be necessary, for example, to protect or preserve natural areas, and historic sites, or, in some special instances, to protect high-yield agricultural lands.

Increased Concentration: Moderate and Maximum

To reduce demand for conversion of forest or agricultural land to urban use, the most effective action would be to concentrate development at higher densities than has occurred in the recent past. This would require well coordinated development programs, as well as additional regulatory measures, and incentives and disincentives associated with the permitted or encouraged uses of land.

A good city is one whose residents experience large amounts of varied open space as a regular part of daily life. Conventional high-density development often precludes this. Even so-called garden apartments provide but a very limited range of attractive play spaces and natural areas.

High density has not been used to create the best possible environments. Like their low-density counterparts, many high-density developments seem to combine many of the worst qualities of urban living.

The ostensible underlying values of high- and low-density developments are efficiency and amenity. The only practical means of reconciling these two characteristics may lie in what might be called designing for high net densities to promote efficiency, and low gross densities to ensure amenities and open space. Cluster development is a step in this direction. As now practiced in Connecticut and New York, however, it is a mere beginning.

Urban design to combine high net — low gross density combines efficiency, amenity and spaciousness. Human scale is not incompatible with high densities nor is the integration of residential use with other activities — cultural, institutional, commercial — inherently undesirable, as for example, in a multiple use building that combines offices and residences. Professional offices in apartment buildings are quite common. This concept could be expanded to include the integration of a wide range of uses within the same building complex.

The following could be realized by concentrated or compact development when brought under a common design:

- Concentrated centers of population would permit a more efficient use of mass transit — the improvement of existing routes and the institution of new routes;
- The need for travel in daily life could be substantially reduced while expanding the opportunities for recreational travel. The necessity of multiple car ownership could be lessened considerably;
- Many daily activities, including employment, could be brought within walking distance or a short bus ride of one's dwelling;
- If people were to live closer to one another, it would make it much easier for a locality to provide varied recreational, civic, social and cultural opportunities, as well as for residents to use them more intensively;
- Higher densities would promote savings in land, streets, curbs, sidewalks, and utility lines. This might be offset initially, however, by the higher construction costs necessitated by more complex buildings and supporting facilities to serve such complexes;
- Larger and more varied amounts of open space might be available within a shorter distance;
- Integrated building complexes could make possible considerable energy savings in lighting, air conditioning, and heating;
- With reduced need for mobility and more efficient utility systems, per capita energy requirements could be decreased without arbitrary restraints.

Policies designed to concentrate development at densities of from 5,000 to 10,000 persons per square mile would severely restrict the present pattern of suburbanization. Except for possible new town development, this density range would tend to concentrate the projected population increment within or adjacent to existing urban areas where the volume and range of transportation and consumer services would be most readily available. If this course were to be pursued, it would imply:

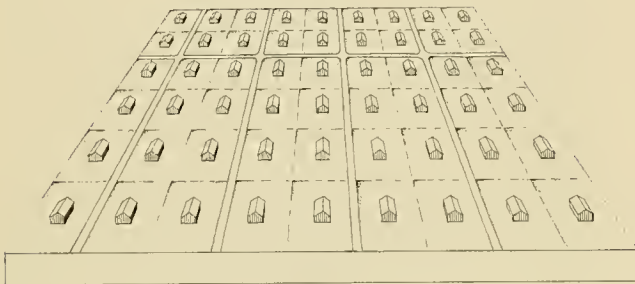
- A major commitment to the use of public transportation, and substantially reduced reliance on the automobile for shopping and other daily needs, as well as for the journey to work;
- Major rebuilding of the core cities, and a concomitant reversal of the outmigration of

middle-income families from urban centers.

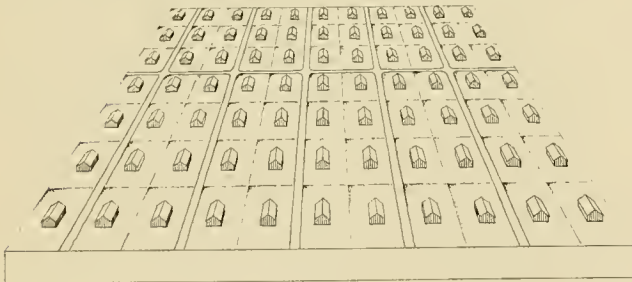
- Limited in-migration of suburban homeowners to central cities who, because of economic or changing family status, find higher-density living a more attractive alternative.
- Greater public spending for a wide range of programs — education, culture, public safety, urban parks and recreation — to improve the quality of life in cities.

- Broadened programs to encourage cooperative and condominium housing so that occupants could benefit from tax laws as conventional homeowners do.

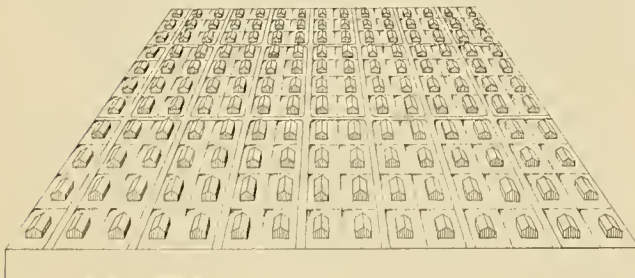
Density refers only to the number of people in any area. These three sketches show the effect of increasing the gross density of an area in single family homes. In trying to visualize what density figures actually mean, it is important to not only think of the number of people, but the type of housing they occupy. As shown on page 38 and 42, density can be increased without destroying an area's natural features (preserve open space by varying housing type).



2500 persons/square mile (section = 1/16 sq. mi.)



3500 persons/square mile (section = 1/16 sq. mi.)

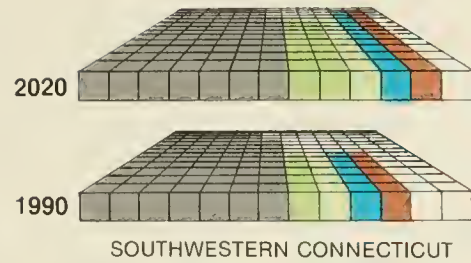
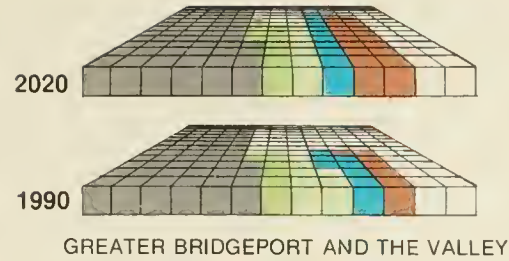
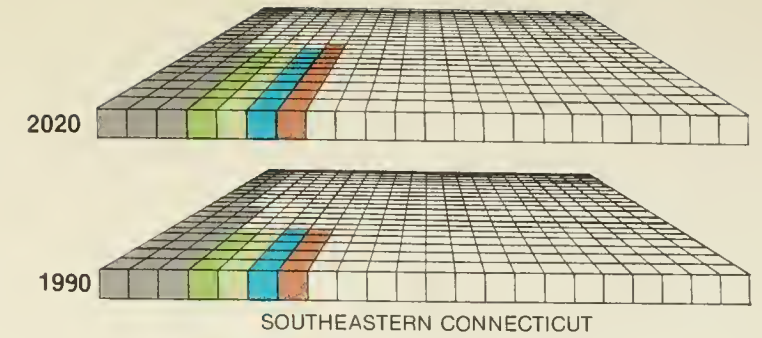
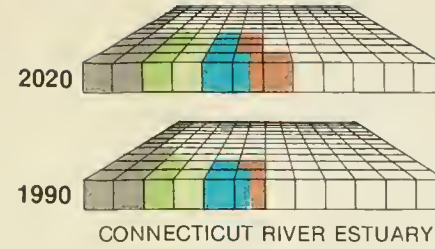
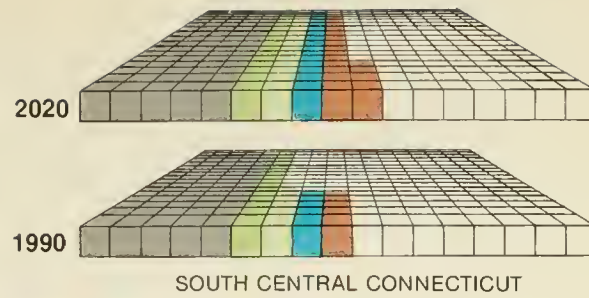


7500 persons/square mile (section = 1/16 sq. mi.)

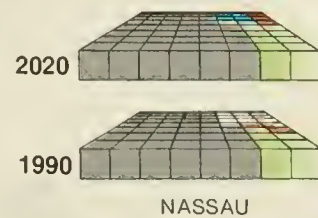
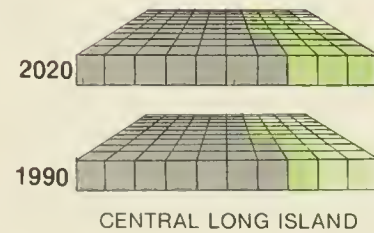
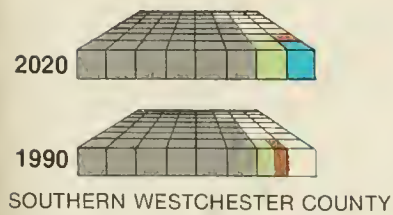
Map 6

URBAN LAND CONSUMPTION

All land which has been developed for use can be described as “urban”. This map shows the percentage of each subregion currently developed and the percentages for 1990 and 2020 based on accommodation of projected increases in population at different densities. The size of the blocks is proportional to the size of the subregions.



CENTRAL LONG ISLAND:
LAND AREA INSUFFICIENT TO ACCOMMODATE
PROJECTED POPULATION AT 2500 or 3500
PERSONS PER SQUARE MILE.



MAP 6

URBAN LAND CONSUMPTION

LONG ISLAND SOUND REGIONAL STUDY

% Developed Land 1970	10,000 Persons/Sq. Mile *
% Developed Land	5,000 Persons/Sq. Mile *
% Developed Land	3,500 Persons/Sq. Mile *
% Developed Land	2,500 Persons/Sq. Mile *

* If all post-1970 development of open land achieved these densities (as trend is projected). New York City not available.

Area of each square is proportional to the area of corresponding subregion

SOURCES: NEW YORK LUNR & CONN. DOT
THE LONG ISLAND SOUND REGION
AN ECONOMIC PERSPECTIVE
SCALE: 1 INCH = 8 MILES 1:500,000 approx

PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
BY RALPH W. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT



CRITERIA

As the previous section of this report noted, three general criteria — Environmental Quality, Social Well-Being, and National Economic Development — were used in evaluating (1) measures and (2) development patterns. The criteria were derived from the Principles and Standards of the U.S. Water Resources Council as interpreted by the LIS study staff of the New England River Basins Commission.

With respect to evaluating alternative measures, criteria used were those suggested by the LIS study staff, and are as follows:

Environmental Quality

- Natural Beauty
- Land: Erosion and Sediment
- Water: Water Quality
- Air: Air Quality
- Terrestrial: Plants
- Terrestrial: Animals
- Aquatic: Plants
- Aquatic: Animals: Anadromous; Resident, Cold Water; Resident, Warm Water
- Archeological-Historical
- Biological
- Geological
- Irreversible Commitments
- Summary Environmental Rating

Economic Development

- Annual Benefits
- External Benefits
- Present Worth
- Annual Costs
- B/C Ratio
- Jobs
- Population
- Economic Base and Stability
- Environmental Desirability
- Summary Economic Rating

Social Well-Being

- Primary Incidence of Benefits
- Primary Incidence of Costs
- Life, Health and Safety
- Educational, Cultural, Recreational
- Energy Conservation
- Other
- Land Use
- Water Quality
- Water Supply
- Shoreline Appearance and Design

- Erosion and Sedimentation
- Flood Damage Reduction
- Recreation
- Fish and Wildlife
- Transportation
- Minerals
- Power
- Legal, Judicial Involvement
- Agencies Primarily Responsible
- Ease of Administering
- Preferability of Non-federal Action
- Ease of Creating Institution
- Ease of Passing Law
- Community Continuity
- Environmental Attractiveness
- Years to Implement (+soon, —many)
- Summary Social Rating

In applying the criteria to development patterns a more general series of indices were used and are listed in the matrix on page 51.

EVALUATION OF MEASURES

In organizing the evaluation of the alternative measures, a matrix was used, (see Appendix D), whereby each measure is rated against the 54 environmental and social criteria. The highlights of the evaluation are presented in this section, with Table 1 summarizing the matrix. Because of the inherent differences between land use and other functional areas, land-use implementation measures cannot be evaluated in the same way, for example, as a flood control structure. Nevertheless, some process of evaluation must be used, and for purposes of consistency among work groups, the Land Use work group has followed the recommended procedure established by the NERBC study management.

Environmental Criteria

As Table 1 shows, land-use regulations and acquisition measures that minimize use of the land rate favorably. Measures encouraging present use, and those directing the location and intensity of urban development, or facilitating legal access to amenities, all come out with a neutral rating. Measures encouraging most forms of development rate poorly.

Economic Development Criteria

Regulatory measures that prevent encroachment of inappropriate development and establish minimum

density requirements draw favorable evaluations. From a public investment standpoint, minimum-density regulations tend to be the least expensive measures. Actions encouraging the best use of special opportunity areas as well as those that direct the location of development rate an appraisal of "fair." When evaluated against economic development criteria, measures reducing urban land demand rate poorly.

Criteria of Social Well-being

When judged against this criteria, most of the implementation measures rate favorably. Such implementation measures include those stressing protective restrictions; those increasing amenities; those encouraging best use; and some of those directing the location of development. Measures facilitating legal access to amenities, however, receive only a fair rating.

Comment on Procedure

When discrete items are judged against discrete criteria, the result may be contradictory summary evaluations. In absolute terms, for example, any

development will have a harmful effect on the environment in that it changes it or diminishes it in some way, perhaps irrevocably. But, in a broader geographic context, it may have a beneficial value. Should directing the location of urban development to appropriate sites, then be rated harmful if such development channels growth into some areas but protects more fragile areas? At the other end of the spectrum, evaluating "no growth" is just as complex. Restricting population growth may ultimately mean that no new construction occurs, but it does not necessarily guarantee a reduction in air or water contaminants.

It is only when measures are combined into multifaceted programs, and applied to selected geographic areas, that any significant evaluation can be made. To do this in any meaningful way, the various land-use measures must be combined with the recommendations of all the other work groups — a synthesizing task which ultimately must be performed by the LISS management staff.

Table 1: Summary of Detailed Evaluation of Alternative Measures*

	Environmental Quality	Economic Development	Social Well Being
Measures to protect the supply of special opportunity areas			
To prevent encroachment of inappropriate uses			
1. Establish protective regulations	Fair	Good	Good
2. Increase public awareness of protection benefits	Fair	Fair	Fair
3. Reduce the landowners' losses through cash compensation	Fair	Good	Fair
4. Reduce the landowners' losses through use of the cluster principle	Fair	Good	Fair
5. Use nonregulatory measures (such as sewerage policies) more effectively	Fair	Fair	Good
6. Use large lot zoning in selected areas	Fair	Fair	Good
To facilitate and encourage the best use of special opportunity areas			
1. Reduce the private cost of "best use" through tax reductions	Fair	Good	Good
2. Increase private profit from "best use" through protecting the private market and through loans or subsidies	Fair	Fair	Good
3. Purchase land for activities requiring public access and for activities having large or unique site requirements	Fair	Fair	Good
Measures to reduce development pressures on special opportunity areas			
To direct the location of urban development			
1. Use public facilities planning and investment	Fair	Fair	Good
2. Designate and protect appropriate locations for development and institute NEPA-type requirements for EIS	Fair	Fair	Good
3. Increase the density of urban development	Fair	Good/Fair	Good
Measures to increase opportunities for access to the amenities of the LIS study area			
1. Facilitate legal access through constitutional and statutory challenges to restrictions and through state, local or federal legislative action	Fair	Fair	Fair
2. Increase the amenity supply through buying areas now private or developing areas already public.	Fair	Fair	Good
3. Facilitate access through improved public transportation	Poor	Fair	Good

*The basis for the evaluations and the detailed evaluations themselves can be found in Appendix D.

EVALUATION OF DEVELOPMENT PATTERNS

The evaluation of alternative development patterns used an approach similar to the one employed in rating measures. The matrix appears below. To summarize, the alternative development patterns rate as follows:

Development Patterns	CRITERIA		
	EQ	RD	SW
Present Pattern	F/P*	F	F
Increased Dispersal	P	P	P
Increased Concentration	F/G	F/G	F/G
Maximum Concentration	G	G	G

Present Pattern

With respect to environmental quality, projecting present growth patterns results in a fair to poor ranking. In such a context, the study views the chances of preserving ecologically fragile environments and unique sites or situations as poor, the inference being that either stringently enforced regulatory measures or fee simple acquisition would be required. The probability of protecting prime agricultural land and stream valleys would be equally poor.

Application of regional development criteria draws a fair composite rating. This reflects judgments that the availability of industrial sites and external economics would be poor, while the spread in consumer markets would be good.

With respect to social well-being, the composite rating is fair. Choice of life styles and tenure, however, elicits a poor evaluation as does variety in the social environment.

Increased Dispersal

The alternative of future growth occurring at reduced densities (with its implication of continued random urban development over a larger proportion of the Sound region's land area) rates poorly on all three criteria. Good ratings appear only in four instances: opportunity for privacy, availability of both industrial sites and expansion area, and enhancement of audiovisual quality.

Moderate Concentration

Compared with existing development patterns, a moderate increase in concentration of development

results in more favorable composite ratings on all three criteria. For example, preservation of fragile environments, unique sites and scenic locales all receive good ratings as does protection of shoreline and flood plains. Under the two previous alternatives, they drew either a poor or fair rating.

Maximum Concentration

By far the best ratings occur under the maximum concentration alternative, with a good rating assigned to all three criteria. A poor rating is registered only in three instances - opportunity for privacy and enhancement of audiovisual quality. The resistance to very high-density living, however, probably makes this alternative acceptable only in limited areas for a small fraction of the population increment. Even then, it would probably have to occur under circumstances in which it is clearly offset by other "marketable" advantages such as — superior building and site design, convenience to transportation and access to recreational opportunities.

EVALUATION OF DEVELOPMENT PATTERNS

	Present Pattern	Increased Dispersal	Concentration Increased	Maximum
Social Well Being				
Choice in				
• Life styles	P	P	F	G
• Transportation mode	F	P	F	G
• Tenure (own or rent)	P	P	F	G
Variety in				
• Visual environment	F	F	G	G
• Social environment	P	P	F	G
Opportunity for				
• Privacy	F	G	F	P
• Participation	F	P	G	F
• Association	F	P	G	G
Accessibility to				
• Employment centers	F	P	F	G
• Commercial services	F	P	F	G
• Public open space	F	P	G	G
Regional Development				
Availability of				
• Labor market	F	P	F	G
• Consumer market	G	F	G	G
• Utilities	F	F	G	G
• Industrial Sites	P	G	F	F
• Commercial sites	F	P	G	G
• External economies	P	P	F	G
• Efficient transport	F	P	F	G
• Expansion area	F	G	F	F
Environmental Quality				
Preservation of				
• Ecologically fragile environments	P	P	P	P
• Unique sites or situations	P	P	G	G
• Scenic or aesthetically pleasing locales	F	F	G	G
Enhancement of				
• Water quality	F	P	F	F
• Air quality	F	F	F	F
• Audio-visual quality	F	G	F	P
Protection of				
• Prime agricultural land	P	P	F	G
• Stream valleys	P	F	F	G
• Shoreline	F	P	G	G
• Flood plains	F	P	G	G

*Patterns are rated G(Good), F(Fair), P(Poor).

*EQ = Environmental Quality, RD = Regional Development, SW = Social Well-being



7: WORKGROUP RECOMMENDATIONS

Based on the exploration of alternatives in the previous chapter, the following recommendations are put forward for incorporation into the overall plan for the Long Island Sound Study Area.

SUBAREA DEVELOPMENT

Maritime Edge

The area between the waters of the Sound and its immediate uplands should be subject to the most stringent controls, the purposes being to reduce development pressure, preserve the supply of available natural resource areas and make the most out of available amenities. Urban waterfronts should be reserved or redeveloped for:

1. Open space or recreational use
2. Water-related industrial use
3. High-density residential development

Development proposals for nonurban areas along the shore should receive intensive review. High priority should be assigned to those activities that:

1. Promote public access
2. Preserve natural features
3. Supply regional needs for supportive facilities

Low- and moderate-density residential development merit low priority in shorefront areas. Industrial activities with no demonstrable need for a waterfront location should be prohibited from the Maritime Edge. This curb should apply also to commercial activities unrelated to waterfront use,

including offices. Proposals for high-density residential development along the shoreline should be examined within a regional context to determine their relative social and environmental costs and benefits. Design criteria should be developed regarding height and landform compatibility. High impact projects — both residential and non-residential — should be carefully scrutinized by an administrative or governmental agency or body whose interests transcend purely local concerns. Periodic review of local zoning, zoning changes and other regulatory actions affecting permitted uses should be conducted to evaluate cumulative effects of local decisions on issues of regional or state concern.

Coastal Sector

This sector — loosely defined as between I-95 in Westchester and Connecticut, and Route 25A in Long Island — particularly the area west from New Haven to New York City, and northern Nassau County on Long Island is now the most intensively developed segment of the study area.

Within it lies a concentration of transportation facilities and major urban centers, including large clusters of industrial and commercial activities.

Remaining open land will be under extreme pressure for development in the coming decades. Since much of Connecticut's coastal sector is now supplied with public water and sewer facilities or will be in the near future, there will be few constraints on development other than land costs. This is also true of the Long Island portion of the study area since developers are permitted to install private package plants for sewage treatment.

Because of the coastal sector's excellent transportation facilities, every effort should be made to allocate sites for projected industrial use and for region-serving public utility installations. Relocation of industrial activities from the shoreline, to this area if a shorefront site is no longer needed, should be considered for this area.

In addition to employment activities, the coastal sector should be the area within which moderate and high density residential development receives high priority. To the extent possible, incentives and other measures should be used to encourage residential and related development at key transportation points, including railroad stations and highway interchanges. It is important to take these high access opportunity areas into account in any future programs for rail right-of-way improvement or realignment, and highway construction. This can insure that the type and intensity of adjacent development is consistent with the locational attributes of the site.

Interior Uplands

The bulk of this area lies in Connecticut, north of I-95, and contains the largest amount of land subject to future development. It is also the area within which most of the farm and forest land as well as water company holdings are concentrated. It has the most varied topography, and any development design must consequently consider soils, slope, and bedrock geology. Most of the open land lies north of the Merritt Parkway west of New Haven, and north of I-95 east of New Haven.

To the extent possible, new development at a full range of densities should be encouraged in this planning subarea. The extension of sewer lines and, to a lesser extent, water lines, should be planned in accordance with regional planning agency and town comprehensive plans, most of which incorporate concepts of concentration around existing centers or along transportation corridors and nodes. Future development in the interior part of the study area will have little direct, immediate impact on the Sound. The cumulative long-range effects of development will be significant, however, particularly in generating increased demand for water-related recreation, and in affecting the quality of fresh-water runoff that will eventually reach the Sound through tributary streams.

No specific recommendation can be made at this time for pollution problems that cannot be ascribed to an identifiable source except to encourage localities to adopt subdivision regula-

tions minimizing erosion and resultant stream sedimentation. In addition, localities should also begin the process of planning for the collection and treatment of storm water runoff, a major source of water pollution.

OPEN SPACE

The issue of open space cuts across all three planning subareas (maritime edge, coastal sector and interior uplands), and merits special consideration.

The demand for open space and recreational facilities is growing rapidly in all parts of the study area, reflecting rising incomes and increased leisure time. Existing recreational areas are unable now to accommodate the many persons seeking a more natural environment, and they will be even less likely to absorb the pressure from future suburban population expansion.

Inadequate supply, increasing demand, and the many publicly owned but undeveloped open space areas suggest a need for new programs and concepts that can benefit urban, suburban, and rural dwellers. Certain open lands — particularly shoreline, prime agricultural and forest lands, watersheds — have excellent scenic and recreational potential. Others such as wetlands, wildlife preserves, steep slopes and unique vegetation habitats represent extremely valuable ecosystems meriting protection and preservation.

It is proposed, therefore, that a linked system of open space elements be established to meet the needs of the LIS area. The objectives of the system would be twofold:

- To preserve and enhance the natural resources of the area and recapture it in sectors that now show the blighting effects of careless urban and suburban development
- To satisfy and augment the outdoor recreational needs of the region by providing easier access for a greater number of residents and visitors.

The proposed open space system would be designed to provide a wide range of year-round recreational opportunities for all residents of the study area.

Its creation could also define and shape the growth of urban areas, while providing city dwellers with

Map 7

WATERFRONT OPPORTUNITIES

The purpose of this map is to provide a brief description of existing opportunities for favorable development of the study region.

INTERIOR UPLANDS - the rest of the study area

Interior Uplands
new development at a full range of densities - Concentrate development around existing centers or along transportation corridors and nodes - program focused on erosion control to reduce stream sedimentation, control of urban storm water runoff, protection of streambelt corridors, preservation of watershed areas as open space, preservation of agricultural and forest watershed areas as open space.

COASTAL SECTOR:
area oriented to the water generally bounded by I-95 in Connecticut and Route 25A in New York

urban waterfront redevelopment potential all uses

Maritime Edge open areas - promote public access, preserve natural features, accommodate regional support facilities

implement Gateway Conservation Zone at Connecticut River

urban waterfront renewal potential

preserve Mysis Islands recreational and natural uses

Coastal Sector
high priority to medium and high density residential uses
locate development to better utilize excellent transportation facilities
relocate non-water related shoreline uses into larger coastal sector
allocate industrial/public utility sites

urban waterfront renewal
Pleasure Beach new regional beach
Conserve Charles Island

MARITIME EDGE:
Where land and water meet

Thom Island recreation and nature preserve potential when released by Federal Gov't

preserve fragile bluff areas

Route 25A

preservation of agricultural land

institutional land should be acquired

Maritime Edge urban areas
reserve or redevelop urban waterfronts for open space/recreational use, water related industrial/commercial use, high density residential use

large recreation areas need improved water quality
Ferry Point Park - recreation development potential
Fort Totten - historic recreation area potential when released by Federal Gov't
urban redevelopment mixed uses
industrial renewal water related
urban waterfront renewal
Cummings State Park beach development
preserve Nojwalk Islands
urban waterfront renewal
Payland - additional recreational development potential
David's Island
Hen Island for public uses

MAP 7 WATERFRONT OPPORTUNITIES

LONG ISLAND SOUND REGIONAL STUDY

SOURCE NEW YORK LUNR & CONN DOT
SCALE 1 INCH = 8 MILES 1:500,000 approx



PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT

ready access to nonurban amenities. Careful planning could also assure the preservation of historic and culturally important areas and provide opportunities for environmental research and education. The proposed Long Island Sound system might serve, too, as a continuation of an even larger open space system on the Atlantic Coastline, linking the Gateway National Recreational Area, the Fire Island National Seashore, and the Cape Cod National Seashore.

As presently conceived, the open space system would be regional. It would utilize the shoreline and streambelt areas to link the existing recreational and available open space areas with selected areas intended for open space preservation and nature conservation (including prime agricultural and forest lands), water bodies and water supply lands, and scenic, recreational, and cultural features. Selectivity is emphasized because not every open space area would be included; rather, those areas would be chosen that are unique, ecologically fragile, or strategically located to function as a link in an overall system. Two general priorities of acquisition are recommended as part of the open space package to supplement existing public open spaces.

The Primary System

The primary system, predominately a network of sea and shoreline areas, would include the most important natural resource areas and landscape features in the LIS study area. It should be composed mainly of selected estuarine and marine sanctuaries (such as the mouth of the Thames and Connecticut Rivers and Fisher's Island Sound), a seashore segment (especially toward the eastern end of the Sound), and selected islands (including the Norwalk and Mystic Islands, Plum Island, and others). All these natural areas are irreplaceable. Early and decisive action is necessary to secure, preserve, and protect them from inappropriate use.

Besides meeting conservation needs, the primary system will also accommodate a large share of the extensive outdoor recreational demands of the region. New and expanded parks and beaches are needed to supplement existing water-related recreation areas. Among the selected areas are Silver Sands State Park and Charles Island in South Central Connecticut and Pleasure Beach in Bridgeport, the latter as yet unacquired by the state.

The Secondary System

The secondary system will complete a comprehen-

sive open space plan throughout the region. It provides areas for regional open space and recreational needs that either cannot be accommodated by the primary system or do not meet the latter's natural resource qualifications. Included are parcels of land — as yet undeveloped or unacquired — that may function as important physical links in the open space system, serving as unifying elements in addition to providing major access to and through it. Both land and water based access to the links will rely on minimal energy use and nonmechanized transport wherever possible, in keeping with sound ecological principles.*

Because of the diversity of the area and its open space needs, money and manpower will have to come from different levels of governments as well as from private recreational enterprises. Meeting various needs of all involved in and affected by the open space system will, therefore, require a well-coordinated "mix" of legislative and administrative policies.

IMPLEMENTATION

Assuming that governments and citizens find merit in the study group's recommendation, the ultimate test of a strategy still lies in its implementation. The measures for implementing the foregoing recommendations for the three planning subareas of the Long Island Sound Study Area would probably take — and, indeed, should take the following forms:

- 1. To prevent inappropriate development of special-opportunity areas, state and local governments should establish protective regulations that make full use of constitutionally available powers.**

Regulations should constitute a first line of defense against inappropriate development of special opportunity areas such as wetlands, aquifer recharge areas, shorelines, etc. As noted, however, regulations often prove ineffective when challenged in the courts or when developers exert pressures on legislators or administrators. A well-rounded program to

*Twenty three states and the District of Columbia have cleared requests with the Transportation Department to use \$24.1 million of highway trust monies to build bike paths, pedestrian overpasses and hiking trails. With federal clearances, each state may transfer up to \$2 million of its trust fund for such projects.

protect these areas must take account of the weaknesses inherent in regulations.

Wetlands. Probably more than any other special-opportunity areas, wetlands seem likely candidates for effective regulatory protection. This is true for several reasons. Public support for wetlands protection in the study area is high. Moreover, wetlands needing protection can be identified by examining present natural conditions, often a far easier task than, say, identifying an area suitable for high-intensity urban use. And in many instances (though by no means all), regulated wetlands have not been highly valued in the market-place, so the owner's loss resulting from the regulation is often relatively small. For all these reasons, the practical effectiveness of wetlands laws — if they withstand constitutional challenges — seems likely to be great.

For other special opportunity areas, the long-range effectiveness of regulations is likely to be more limited. This is particularly true of some prime agricultural land as well as other areas that are physically suitable or even attractive for urban use, and whose protection remains relatively low in citizens' priorities. As tools for achieving public objectives, the effectiveness of regulations is also limited in prime recreation areas or other lands whose best use requires access by the general public. The protection of these areas requires supplementary measures.

2. Governments should encourage and, wherever appropriate, require use of the cluster principle.

This would serve as a catalyst for more imaginative urban design than localities now have. It would cut the losses sustained by owners of protected land areas. And most important of all, perhaps, it could help conserve that precious commodity, land.

The cluster principle including planned unit development, could minimize the impact of growth by guiding development to areas where its effect on water quality and land resources would not be severe. Governments could encourage growth at these sites through early provision of services such as water and sewerage facilities, transportation, community facilities and open space.

3. The states should establish effective economic

incentives to permit and encourage the best use of special opportunity areas, including prime agricultural, recreational and forest lands.

- a) If permanently committed to agricultural use by deed or contract, prime agricultural land should be assessed for tax purposes at no more than its value for agriculture. Present laws granting reduced assessments for shorter-term agricultural use should be reevaluated to determine their actual impact.
- b) As long as agricultural production from land permanently committed to that use provides the main income for its resident owner, the states should consider still further tax reductions for prime agricultural land. Experience with similar legislation in Vermont may soon prove useful in evaluating the effectiveness of such reduction on the ability of family farms to prosper.
- c) Governments should encourage private owners of prime recreation lands to develop them for recreational use by the general public.

Before constructing or subsidizing public recreation facilities — marinas, for example — governments should carefully examine the impact of their action on the private sector. Specifically, they should satisfy themselves that any resulting reduction in the ability of competing private facilities to thrive will not cause prime recreational land in private hands to be lost to a less appropriate use. This should be true whether the competing private use is an actual or potential one.

4. Governments should acquire those special opportunity areas whose best use cannot be realized in any other acceptable way.

Prime recreational areas, whose best use requires access by the general public, should receive high priority for acquisition. Special urban development sites (for transportation rights-of-way, high-intensity urban centers) should also receive major attention.

Suffolk County has developed a detailed proposal for the purchase and leaseback of farmland on Eastern Long Island to preserve the acreage for agriculture. The proposal recommends both outright purchase of the land and purchase of development rights. Extension of this program to the Connecticut portion of the

study area merits immediate attention by the State Department of Environmental Protection to determine its applicability within a somewhat different administrative context.

- 5. To enable states to buy needed land and provide recommended economic incentives to farmers, the states should establish capital gains taxes to recover a sizeable share of private profits originating in speculative real estate deals.**

Vermont, which has adopted precisely such legislation, might again serve as a model.

- 6. The states should establish policies to encourage or require the provision of sewers and waste water treatment plants in areas where urban development exists or is appropriate. Conversely, they should discourage or prevent such facilities where urban development is inappropriate.**

Under Section 208 of the Federal Water Quality Act of 1972, the states may find the most convenient mechanism for establishing and implementing these policies.

- 7. The states should require the preparation of Environmental Impact Statements to assure consideration of the environmental, economic and social consequences of proposed development. Statements should be a requirement, however, only for projects whose size, location and nature make them significant or those that are not in accord with a state-approved development plan.**

Taking their cue from the National Environmental Protection Act, some states and localities require environmental impact analysis of project proposals. But federal and most state and local requirements provide simply for disclosure of assessed impact rather than for impact analysis in relation to long-range comprehensive plans. The methods developed for impact analysis of any given project can be extended to examine which of a number of project proposals is likely to have the least harmful affects.

- 8. To achieve both high density and a high level of amenity, governments should initiate a long-range program to encourage the development and redevelopment of urban centers.**

High densities do not automatically confer a high quality of life anymore than low densities do. But high densities do increase opportunities for providing urban services within walking distance. And they also increase opportunities to provide high-density transportation.

Government institutions and facilities should be located to encourage recentralization. High-speed rail service (comparable to that planned or already available in other regions) should be made available to major urban centers in the LIS study area by 1990. Governments should also exert pressure for the expansion of programs that encourage large scale urban design and the necessary assistance in financing and land assembly. Some of these programs are now administered by HUD and other federal agencies.

- 9. To the extent that local governments are willing and able to consider the well-being of residents other than their own, they should bear responsibility for land-use guidance. To the extent that governments are unwilling or unable to act in this manner, higher levels of government should assume the responsibility.**

Where local revenues are inadequate for financing needed acquisitions and economic incentives, state and federal governments should provide money for actions of state and national concern.

Higher-level governments should reduce or remove incentives for local actions that are inconsistent with the larger public good. State assumption of costs now borne by local governments could remove some economic incentives for exclusionary local measures.

Either initially or on appeal from local actions, the states should assert regulatory control over projects and areas that are of critical concern to the states.

State legislatures should enact laws restricting the powers of local governments to act inconsistently with the needs of those who live elsewhere, and the courts should invalidate local restrictions that abridge statutory or constitutional rights of nonresidents.

The states and the federal government should acquire sites and construction facilities that will greatly increase the total supply of

needed public facilities particularly those open on the waterfront to the general public. The mere provision of legal access to existing facilities is not going to meet projected needs adequately.

- 10. Federal, state and local governments should intensify and extend current efforts to create public awareness of the need to protect**

special-opportunity areas.

One of the main justifications of planning is that, at its best, it creates awareness of opportunities, creates demands for siezing those opportunities and generates disappointment when they are lost. Open space and other plans that help to heighten awareness of citizens' sensitivity to their surroundings, can be particularly influential.



8: NERBC STUDY RECOMMENDATIONS

The preceding recommendations *have not* necessarily been approved by the New England River Basins Commission. At the time of this report's publication, the draft main report of the Long Island Sound Regional Study is undergoing public review and comment for consideration in the final document. The FINAL RECOMMENDATIONS on Land Use are therefore to be found only in the final version of the Study's main report--to be published in the Spring of 1975.

COORDINATING GROUP LONG ISLAND SOUND REGIONAL STUDY

As of the date of this report

New England River Basins Commission
State of Connecticut
Conn. Planning & Budgeting Division
State of New York
Interstate Sanitation Commission
Tri-State Regional Planning Commission
Atomic Energy Commission
Department of Agriculture
Department of the Army, Corps of Engineers
Department of Commerce
Department of Housing & Urban Development
Department of the Interior
Department of Transportation
Environmental Protection Agency
Federal Power Commission
Nassau-Suffolk Regional Planning Board
Citizen Advisory Committee
Research Planning Advisory Committee
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Nassau-Suffolk Regional Planning Board
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Primary responsibility for these planning reports rests with the chair agency indicated above. The other agencies and individuals listed participated either in an active, a review, or an advisory role, but their listing here does not necessarily imply an endorsement of the report in whole or in part.

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APPENDIX B REFERENCE TABLES AND MAPS

REFERENCE TABLE I: POPULATION AND PROJECTIONS

POPULATION AND PROJECTIONS: COUNTIES

CONNECTICUT

FAIRFIELD COUNTY

Year	Population	% Increase Over 1970
1960	653,589	----
1970	792,814	----
1980	893,900	12.7
1990	990,500	24.9
2000	1,068,500	34.8
2020	1,203,000	51.7

MIDDLESEX COUNTY

Year	Population	% Increase Over 1970
1960	88,865	----
1970	115,018	----
1980	139,700	21.5
1990	164,900	43.4
2000	186,300	62.0
2020	224,000	94.8

NEW HAVEN COUNTY

Year	Population	% Increase Over 1970
1960	660,315	----
1970	744,948	----
1980	839,400	12.7
1990	928,100	24.6
2000	993,100	33.3
2020	1,107,000	48.6

NEW LONDON COUNTY

Year	Population	% Increase Over 1970
1960	185,745	----
1970	230,654	----
1980	259,700	12.6
1990	289,900	25.7
2000	312,700	35.6
2020	353,000	53.0

NEW YORK

NASSAU COUNTY

Year	Population	% Increase Over 1970
1960	1,300,171	----
1970	1,428,830	----
1980	1,580,400	10.6
1990	1,677,000	17.4
2000	1,719,500	20.3
2020	1,794,000	25.6

SUFFOLK COUNTY

Year	Population	% Increase Over 1970
1960	666,784	----
1970	1,127,030	----
1980	1,635,800	45.1
1990	2,146,800	90.5
2000	2,596,900	130.4
2020	3,380,000	199.9

WESTCHESTER COUNTY

Year	Population	% Increase Over 1970
1960	808,891	----
1970	894,104	----
1980	994,700	23.0
1990	1,059,600	31.0
2000	1,106,400	36.8
2020	1,188,000	46.9

POPULATIONS AND PROJECTIONS: TOWNS AND CITIES PORTIONS OF WHICH ARE INCLUDED IN THE LIS STUDY AREA

SUBREGION 6c

OYSTER BAY (6c)

Year	Population	% Increase Over 1970
1960	290,055	----
1970	333,342	----
1980	369,500	10.8
1990	391,700	17.5
2000	401,500	20.4
2020	424,300	27.3

N. HEMSTEAD (6c)

Year	Population	% Increase Over 1970
1960	219,088	----
1970	235,007	----
1980	260,100	10.7
1990	275,700	17.3
2000	282,000	20.0
2020	296,900	26.3

GLEN COVE CITY (6c)

Year	Population	% Increase Over 1970
1960	23,817	----
1970	25,770	----
1980	29,700	15.3
1990	31,400	21.8
2000	32,000	24.2
2020	33,400	29.6

SUBREGION 7

BROOKHAVEN (7)

Year	Population	% Increase Over 1970
1960	109,900	----
1970	245,260	----
1980	450,600	83.7
1990	676,200	175.7
2000	920,500	275.3
2020	1,139,400	364.6

SMITHTOWN (7)

Year	Population	% Increase Over 1970
1960	50,347	----
1970	114,657	----
1980	169,800	48.1
1990	192,100	67.5
2000	195,500	70.5
2020	229,200	99.9

HUNTINGTON (7)

Year	Population	% Increase Over 1970
1960	126,221	----
1970	200,172	----
1980	254,500	27.1
1990	301,000	50.4
2000	323,800	61.8
2023	371,100	85.4

SUBREGIONS 8 & 9

SOUTHOLD (8&9)

Year	Population	% Increase Over 1970
1960	13,295	-----
1970	16,804	-----
1980	24,400	45.2
1990	46,400	176.1
2000	73,800	339.2
2020	153,800	815.3

RIVERHEAD (8&9)

Year	Population	% Increase Over 1970
1960	14,519	-----
1970	18,909	-----
1980	34,000	80.0
1990	67,000	254.3
2000	108,000	471.2
2020	224,100	1,085.1

NEW YORK CITY

Year	Population	% Increase Over 1970
1960	7,736,900	----
1970	7,930,700	----
1980	8,085,700	1.95
1990	8,269,000	4.27
2000	8,430,400	6.30
2020	8,711,000	9.84

POPULATION AND PROJECTIONS: SUBREGIONS

CONNECTICUT

SOUTHEASTERN CONNECTICUT (1)

Year	Population	% Increase Over 1970
1960	179,060	----
1970	220,402	----
1980	246,100	11.7
1990	273,900	24.3
2000	294,500	33.6
2020	332,700	50.6

CONNECTICUT RIVER ESTUARY (2)

Year	Population	% Increase Over 1970
1960	26,733	----
1970	43,021	----
1980	59,600	38.5
1990	74,200	72.5
2000	85,000	97.6
2020	102,000	137.1

SOUTH CENTRAL CONNECTICUT (3)

Year	Population	% Increase Over 1970
1960	448,505	----
1970	507,837	----
1980	563,600	11.0
1990	615,900	21.3
2000	652,200	28.4
2020	726,800	43.1

GREATER BRIDGEPORT (4)

Year	Population	% Increase Over 1970
1960	278,131	----
1970	311,130	----
1980	343,900	10.5
1990	369,900	18.9
2000	383,300	23.2
2020	411,100	32.1

THE VALLEY (4)

Year	Population	% Increase Over 1970
1960	60,241	----
1970	73,700	----
1980	88,000	19.4
1990	102,600	39.2
2000	117,400	59.3
2020	132,600	79.9

SOUTH WESTERN CONNECTICUT (5)

Year	Population	% Increase Over 1970
1960	279,204	----
1970	333,935	----
1980	373,900	12.0
1990	406,600	21.8
2000	431,100	29.1
2020	505,300	51.3

NEW YORK STATE

WESTCHESTER COUNTY (6)

Year	Population	% Increase Over 1970
1960	368,972	----
1970	380,000	----
1980	389,824	2.6
1990	382,838	.7
2000	370,203	-2.6
2020	396,792	4.4

NASSAU (6)

Year	Population	% Increase Over 1970
1960	159,921	----
1970	175,746	----
1980	194,389	10.6
1990	206,271	17.4
2000	211,499	20.3
2020	220,662	25.6

SUFFOLK (7, 8 and 9)

Year	Population	% Increase Over 1970
1960	127,356	----
1970	215,263	----
1980	312,438	45.1
1990	410,039	90.5
2000	495,932	130.4
2020	645,580	199.9

TOTAL CONNECTICUT SECTOR

Year	Population	% Increase Over 1970
1960	1,271,874	----
1970	1,490,025	----
1980	1,675,100	12.4
1990	1,843,100	23.7
2000	1,963,500	31.8
2020	2,210,500	48.4

TOTAL NEW YORK SECTOR

Year	Population	% Increase Over 1970
1960	656,249	----
1970	771,009	----
1980	896,651	16.3
1990	999,148	29.6
2000	1,077,634	39.8
2020	1,263,034	63.8

TOTAL LIS STUDY AREA*

Year	Population	% Increase Over 1970	Year	NEW YORK Population	METRO REGION % Increase
1960	1,928,123	----	1960	-----	----
1970	2,261,034	----	1970	18,725,000	----
1980	2,571,751	13.7	1980	20,767,000	10.9
1990	2,842,248	25.7	1990	22,966,000	22.6
2000	3,041,134	34.5	2000	24,709,000	32.0
2020	3,473,534	53.6	2020	28,093,000 (CAPACITY)	50.0

Reference Table II: DWELLING UNIT PROJECTIONS FOR METROPOLITAN REGION AND LIS STUDY AREA

New York Metropolitan Region:*

	Population	% Increase over 1970	Persons per Dwelling Unit	Dwelling Units	% Increase over 1970
1970	18,725,000		2.92	6,333,000	
1985	21,795,000	16.4	2.76	7,937,000	25.3
2000	24,709,000	32.0	2.66	9,316,000	47.1
2020					
Capacity	28,093,000	50.0	2.60	10,843,000	71.2

Long Island Sound Study Area:**

1970	2,261,000		2.92	774,000	
1985	2,707,000	19.7	2.76	981,000	26.7
2000	3,041,000	34.5	2.66	1,143,000	47.6
2020	3,474,000	53.6	2.66 ***	1,306,000	68.6

* Source: Tri-State Regional Planning Commission

** Source: Population figures from OBERS; calculations assume direct link between metropolitan figures and regional trends.

*** Assume 2000 figure of 2.66 remains constant to 2020

REFERENCE TABLE III: EXISTING LAND USE SUMMARY BY SUBREGION AND STATE

LAND USE CATEGORY	Subregion 1		Subregion 2		Subregion 3		Subregion 4		Subregion 5		Total Connecticut	
	acres	percent*	acres	percent*	acres	percent*	acres	percent*	acres	percent*	acres	percent*
Residential	26,093	7.00	10,294	8.68	49,092	20.45	38,692	30.02	58,108	43.33	182,279	18.33
Industrial	1,104	.30	312	.26	3,492	1.45	2,496	1.93	1,044	.78	8,438	.85
Transportation	3,963	1.06	982	.83	3,929	1.64	1,513	1.17	1,466	1.09	11,853	1.19
Utilities	547	.15	82	.07	595	.25	178	.14	187	.14	1,616	.16
Public-Institutional	2,322	.62	394	.33	2,951	1.23	1,858	1.44	1,990	1.48	9,515	.96
Commercial	2,245	.60	600	.51	5,094	2.12	3,019	2.34	2,858	2.13	13,816	1.39
Recreational	2,792	.75	685	.58	3,885	1.62	3,041	2.36	3,899	2.91	14,302	1.44
Extractive	1,555	.42	326	.27	1,657	.69	263	.20	162	.12	3,963	.40
DEVELOPED	40,648	10.91	13,675	11.53	70,695	29.45	51,050	39.60	69,714	51.99	245,782	24.72
Agricultural	37,178	9.98	3,028	2.55	21,523	8.97	6,253	4.85	1,552	1.16	69,534	6.99
Water	11,401	3.06	5,098	4.30	4,998	2.08	3,812	2.96	2,610	1.95	27,919	2.81
Wetlands	14,658	3.94	7,858	6.62	11,235	4.68	2,950	2.29	2,514	1.87	39,215	3.94
Forest	218,385	58.63	81,367	68.59	101,217	42.16	51,953	40.30	43,924	32.75	496,846	49.92
Undeveloped Uplands	50,205	13.48	7,606	6.41	30,392	12.66	12,883	9.99	13,787	10.28	114,673	11.55
OPEN	331,827	89.09	104,957	88.47	169,365	70.55	77,851	60.40	64,387	48.01	748,387	75.28
TOTAL	372,475	99.99	118,632	100.00	240,060	100.00	128,901	99.99	134,101	99.99	994,169	99.99

LAND USE CATEGORY	Subregion 6		Subregion 7		Subregion 8		Subregion 9		Total New York		Total LIS Region	
	acres	percent*	acres	percent*	acres	percent*	acres	percent*	acres	percent*	acres	percent*
Residential	59,321	50.23	37,709	45.29	1,293	14.73	749	16.99	99,072	46.18	281,351	23.28
Industrial	2,186	1.85	946	1.14	22	.25			3,154	1.47	11,592	.96
Transportation	2,585	2.19	1,395	1.68			243	5.51	4,223	1.97	16,076	1.33
Utilities**	26	.02	256	.31					282	.13	1,898	.16
Public-Institutional	5,536	4.69	3,629	4.36	90	1.03	928	21.05	10,183	4.75	19,698	1.63
Commercial	4,308	3.65	1,024	1.23	6	.07	19	.43	5,357	2.50	19,173	1.59
Recreational	11,572	9.80	6,794	8.16	762	8.68	224	5.08	19,352	9.02	33,654	2.78
Extractive	83	.07	428	.51	64	.73			575	.27	4,538	.38
DEVELOPED	85,617	72.49	52,181	62.68	2,237	25.49	2,163	49.06	142,198	66.28	387,980	32.10
Agricultural	2,906	2.46	2,394	2.88	2,035	23.19	70	1.59	7,405	3.45	76,939	6.37
Water	8,736	7.40	3,796	4.56	160	1.82	64	1.45	12,756	5.95	40,675	3.37
Wetlands	1,157	.98	1,337	1.61	358	4.08			2,852	1.33	42,067	3.48
Forest	10,426	8.83	9,523	11.44	2,234	25.45	282	6.40	22,465	10.47	519,311	42.96
Undeveloped Uplands	9,266	7.85	14,025	16.85	1,753	19.97	1,830	41.51	26,874	12.53	141,747	11.73
OPEN	32,491	27.51	31,075	37.32	6,540	74.51	2,246	50.94	72,352	33.72	820,739	67.90
TOTAL	118,108	100.02	83,256	100.02	8,777	100.00	4,409	100.01	214,550	100.02	1,208,719	100.02

Sources: Connecticut Department of Transportation, New York State Land Use and Natural Resource Inventory, Tri-State Regional Planning Commission, Westchester County Department of Planning, Connecticut Regional Planning Agencies, map interpretation.

*Does not add to 100 percent because of rounding

**New York State LUNR figures include utilities under the Transportation category.

REFERENCE TABLE IV: DENSITIES

IV. A. DENSITY OF SEVEN TOWNS CONTAINING CENTRAL CITIES OF STANDARD METROPOLITAN STATISTICAL AREAS

Density Index	Norwich	Groton- New London	New Haven	Bridge- port	Norwalk	Stamford	Mount Vernon
Gross Area							
Persons per sq. mi. (acre)	1,416.9 (2.2)	1,794.2 (2.8)	7,176.3 (11.2)	9,708.0 (15.2)	3,532.1 (5.5)	3,034.6 (4.7)	17,789.0 (21.5)
Developed Land							
Persons per sq. mi. (acre)	4,756.6 (7.4)	5,039.9 (7.9)	9,920.4 (15.5)	10,749.7 (16.8)	4,576.7 (7.2)	5,361.1 (8.4)	18,294.5 (27.6)
Residential Land							
Persons per sq. mi. (acre)	6,804.1 (10.6)	8,354.0 (13.1)	17,945.9 (28.0)	17,957.9 (28.1)	5,854.8 (9.2)	6,513.0 (10.2)	28,314.8 (44.2)

IV. B. DENSITY OF SEVEN MOST RAPIDLY DEVELOPING CONNECTICUT TOWNS

Density Index	Ledyard	Clinton	Killing- worth	Monroe	Shelton	Guilford	Wilton
Gross Area							
Persons per sq. mi. (acre)	371.4 (0.6)	631.3 (1.0)	68.1 (0.1)	459.0 (0.7)	852.8 (1.3)	254.8 (0.4)	497.0 (0.8)
Developed Land							
Persons per sq. mi. (acre)	3,993.1 (6.2)	2,407.8 (3.8)	1,864.1 (2.9)	2,248.5 (3.5)	3,241.8 (5.1)	2,269.0 (3.6)	1,727.2 (2.7)
Residential Land							
Persons per sq. mi. (acre)	5,059.0 (7.9)	3,168.2 (5.0)	2,301.9 (3.6)	2,537.8 (4.0)	3,820.2 (6.0)	2,763.2 (4.3)	2,001.9 (3.1)

Reference Table IVC

Population Density by Town and Subregion in Persons per Square Mile

Subregion/Town	1970: Gross	Developed	Residential	1990: Gross	2020: Gross
SOUTHEASTERN CONNECTICUT	376.7	3,470.9	5,402.0	470.6	571.6
Bozrah	100.3	2,908.6	6,786.7	200	250
Colchester	133.7	2,870.9	6,002.7	200	250
East Lyme	279.4	1,781.1	2,650.9	350	450
Franklin	68.8	2,712.0	4,520.0	100	150
Griswold	210.4	3,528.6	5,175.3	250	300
Groton	1,162.4	3,902.4	6,374.0	1,350	1,550
Ledyard	371.9	4,010.0	5,116.2	450	550
Lisbon	168.1	3,120.0	4,680.0	300	350
Montville	356.8	2,700.3	4,121.6	450	600
New London	5,271.7	7,714.6	13,752.2	5,300	5,500
North Stonington	68.3	1,972.6	4,164.4	150	200
Norwich	1,414.9	4,743.1	6,842.5	1,600	1,850
Preston	113.7	2,994.2	3,992.2	150	200
Salem	48.8	2,075.7	4,843.3	100	150
Sprague	212.6	2,912.0	5,824.0	250	300
Stonington	404.6	3,007.5	4,427.8	550	700
Voluntown	34.5	1,210.0	2,904.0	50	50
Waterford	496.5	2,426.3	3,589.0	700	900
CONNECTICUT RIVER ESTUARY	232.0	2,010.3	2,672.1	400.3	550.3
Chester	177.5	1,420.0	1,988.0	350	500
Clinton	629.9	2,387.7	3,208.4	1,100	1,400
Deep River	261.7	1,604.3	2,306.3	500	800
Essex	416.2	1,693.4	2,232.3	600	900
Killingworth	68.2	1,873.1	2,213.6	150	200
Lyme	43.0	1,855.0	1,855.0	100	100
Old Lyme	209.5	5,515.6	8,273.3	350	450
Old Saybrook	516.3	2,065.4	2,822.7	750	950
Westbrook	237.3	1,414.8	1,819.0	450	700
Subregion/Town	1970: Gross	Developed	Residential	1990: Gross	2020: Gross
SOUTH CENTRAL CONNECTICUT		4,595.8		1,642.0	1,937.6
Bethany	180.2	2,142.8	2,410.6	400	900
Branford	937.8	3,465.1	4,543.1	1,250	1,700
East Haven	1,993.7	5,024.0	6,441.0	2,750	3,400
Gulfport	254.9	2,270.4	2,734.8	400	550
Hamden	1,482.2	4,329.6	6,327.8	1,850	2,400
Madison	264.7	6,105.0	6,977.1	400	550
Meriden	2,341.4	5,229.8	7,562.0	2,750	3,150
Milford	2,201.6	4,540.9	6,691.8	2,700	2,850
New Haven	7,172.2	9,907.0	17,884.0	6,900	6,700
North Branford	400.7	2,628.8	3,368.1	700	1,000
North Haven	1,056.9	2,264.7	3,522.9	1,550	2,050
Orange	777.2	1,878.3	2,504.4	1,300	1,500
Wallingford	2,052.5	3,501.4	5,668.9	1,100	1,250
West Haven	4,804.6	7,239.9	10,362.9	5,250	5,900
Woodbridge	401.7	1,504.5	1,871.5	800	1,050
GREATER BRIDGEPORT	2,175.7	4,978.1	6,691.0	2,586.8	2,874.9
Bridgeport	9,732.1	10,772.1	17,993.3	9,800	9,800
Easton	170.8	1,252.6	1,356.9	250	450
Fairfield	1,876.6	3,191.4	4,345.2	2,400	2,700
Monroe	459.8	2,230.9	2,563.2	700	900
Stratford	2,705.2	4,879.9	7,429.1	3,450	4,050
Trumbull	1,335.9	2,934.0	3,236.5	2,100	2,550
THE VALLEY	1,262.0	4,260.1	5,302.2	1,756.5	2,270.1
Ansonia	3,412.9	6,612.5	8,464.0	3,900	4,650
Derby	2,333.1	5,477.8	7,874.4	3,300	4,350
Seymour	857.4	3,757.6	4,731.9	1,300	1,700
Shelton	851.6	3,233.9	3,826.1	1,300	1,700
Subregion/Town	1970: Gross	Developed	Residential	1990: Gross	2020: Gross
SOUTHWESTERN CONNECTICUT	1,594.0	3,066.4	3,677.7	1,940.5	2,411.6
Darien	1,582.2	2,082.8	2,489.1	1,850	2,550
Greenwich	1,234.6	2,399.8	2,972.9	1,500	1,750
New Canaan	786.3	1,897.3	2,078.0	1,200	1,450
Norwalk	3,531.8	4,599.6	5,860.2	4,150	5,150
Stamford	3,030.6	5,359.5	6,514.9	3,200	3,750
Weston	365.4	1,454.3	1,545.2	600	700
Westport	1,370.7	1,877.7	2,228.8	2,150	2,900
Wilton	497.1	1,718.0	1,995.9	800	1,250
WESTCHESTER COUNTY	4,382.9	6,250.0	9,596.0	4,414.5	4,575.4
Eastchester	7,625.0	8,318.2	12,620.7	8,450	8,900
Harrison	1,259.9	2,316.6	3,917.1	1,450	1,600
Mamaroneck	3,810.1	5,386.7	8,221.8	4,150	4,350
Mount Vernon	17,750.7	18,194.5	27,991.5	15,700	15,650
New Rochelle	6,282.1	8,019.7	11,597.7	5,900	6,050
Pelham	6,333.2	6,634.8	9,952.1	6,600	6,500
Rye	1,239.8	3,376.4	5,289.7	1,400	1,500
Rye (town)	4,803.8	6,176.3	8,823.3	5,400	5,800
Scarsdale	2,913.5	3,204.8	4,370.2	3,150	3,400
White Plains	5,012.5	6,265.6	10,664.9	4,650	4,650
Nassau County (6c) ¹	2,317.9	3,351.0	4,387.2	2,716.9	2,906.4
Suffolk County (7) ²	1,621.6	2,588.6	3,581.9	3,086.0	4,858.7
Suffolk County (8 & 9) ³	219.1	654.1	1,410.3	416.8	656.2

¹ Assumes 12.3% of Nassau County is included in study area.² Assumes 18.7% of Suffolk County is included in study area.³ Assumes .4% of Suffolk County is included in study area.

Source: 1970 Land Use Data and OBERS Population Figures

REFERENCE TABLE V: SELECTED COASTAL CONDITIONS (in statute miles)

DESCRIPTION	SUBREGIONS									TOTAL
	1	2	3	4	5	6	7	8	9	
Coastal Length ¹	55	40	75	30	50	80	35	30	45	440
Physical Characteristics										
Beach	24	21	50	21	26	24	30	26	40	262
No Beach	31	19	25	9	24	56	5	4	5	178
Critical Erosion ²	4	3	10	4	5	9	35	30	10	110
Non-Critical Erosion	51	31	65	26	45	71	0	0	35	324
Use										
Public Recreational	4	1	6	4	10	18	10	7	2	62
Private Recreational	49	38	67	25	38	0	22	0	30	269
Non-Recreational	2	1	2	1	2	62	3	23	13	109
Ownership										
Federal	1	1	1	0	0	0	3	0	5	11
Non-Federal	12	5	14	5	11	23	12	5	3	90
Private	42	34	60	25	39	57	20	25	37	339

¹Coastline length increases greatly with the detail with which coastal configurations measured, particularly in estuaries such as the Connecticut River. The lengths used here are taken from The National Shoreline Study. In general, they reflect the length of coastline fronting directly on the Sound.

²Critical erosion occurs in those "areas where erosion presents a serious problem because the rate of erosion, considered in conjunction with economic, industrial, recreational, agricultural, navigational, demographic, ecological, and other relevant factors indicate that action to halt such erosion may be justified." (Department of the Army, Corps of Engineers, North Atlantic Division. National Shoreline Study, Regional Inventory Report, North Atlantic Region, 1971.)

Source: Erosion & Sedimentation, An Interim Report October 1973.

REFERENCE TABLE VI: MEDIAN FAMILY INCOME (1970)

	Median Income (dollars)		Median Income (dollars)
<u>SOUTHEASTERN CONNECTICUT</u>		<u>CONNECTICUT RIVER ESTUARY</u>	
Bozrah	11,009	Chester	11,691
Colchester	11,426	Clinton	11,153
East Lyme	11,828	Deep River	11,288
Franklin	11,421	Essex	12,778
Griswold	9,833	Killingworth	11,390
Groton	9,584	Lyme	12,712
Ledyard	12,237	Old Lyme	13,197
Libson	9,771	Old Saybrook	12,171
Montville	11,129	Westbrook	12,332
New London	9,657		
North Stonington	11,496	<u>THE VALLEY</u>	
Norwich	9,768	Ansonia	10,571
Preston	10,763	Derby	11,264
Salem	11,000	Seymour	11,721
Sprague	9,134	Shelton	12,099
Stonington	10,295		
Voluntown	10,607	<u>GREATER BRIDGEPORT</u>	
Waterford	11,654	Bridgeport	9,849
		Easton	17,506
<u>SOUTH CENTRAL CONNECTICUT</u>		Fairfield	14,255
Bethany	14,088	Monroe	13,553
Branford	12,301	Stratford	12,268
East Haven	11,136	Trumbull	14,772
Guilford	12,979		
Hamden	12,438	<u>SOUTHWESTERN CONNECTICUT</u>	
Madison	14,260	Darien	22,172
Meriden	11,089	Greenwich	18,024
Milford	12,414	New Canaan	23,889
New Haven	9,031	Norwalk	12,507
North Branford	12,376	Stamford	13,571
North Haven	13,245	Weston	23,626
Orange	16,734	Westport	21,435
Wallingford	11,921	Wilton	20,755
West Haven	10,649		
Woodbridge	20,697		

WESTCHESTER COUNTY

<u>EASTCHESTER TOWN</u>	
Bronxville village	23,264
Eastchester (unincorporated)	16,705
Tuckahoe village	10,841

<u>HARRISON TOWN</u>	
Tract 0085 (Southern)	46,373
Tract 0086 (Northern)	17,757

<u>MAMARONECK TOWN</u>	
Larchmont village	21,923
Mamoroneck village	13,434

<u>MOUNT VERNON CITY</u>	
10,973	
<u>NEW ROCHELL CITY</u>	
13,183	

<u>PELHAM TOWN</u>	
No. Pelham village	12,530
Pelham Manor village	22,646
Pelham village	*

<u>RYE CITY</u>	
19,925	
<u>RYE (Town)</u>	
**	

<u>Mamoroneck village</u>	
10,727	
<u>Port Chester village</u>	
33,886	

<u>SCARSDALE TOWN</u>	
13,569	

<u>WHITE PLAINS CITY</u>	
13,569	

<u>Connecticut (State)</u>	11,811
Fairfield County	13,086
Middlesex County	11,632
New Haven County	11,303
New London County	10,520

NASSAU COUNTY

Glenn Cove City	12,874
Hemstead	14,222
Long Beach City	11,958
North Hemstead	17,177
Oyster Bay	14,884

SUFFOLK COUNTY

Babylon	11,748
Brookhaven	11,143
East Hampton	10,194
Huntington	14,934
Islip	11,804
Riverhead	9,644
Shelter Island	10,690
Smithtown	13,845
Southampton	9,877
Southold	9,949

<u>New York (State)</u>	10,617
Bronx County	8,308
Queens County	11,555
Nassau County	14,632
Suffolk County	12,084
Westchester County	13,784

* Not available at this time

**Included under Mamaroneck town

Source: U.S. Census of Population, 1970

REFERENCE TABLE VII: DEVELOPED LAND REQUIRED UNDER ALTERNATIVE DENSITY ASSUMPTIONS AND PERCENT OF SUBREGION DEVELOPED

SUBREGIONS		Vacant Land Available In Sewered Areas 2020 (sq. mi.)	1970: Developed Land	% of Subregion Developed
SOUTHEASTERN CONNECTICUT	(Subregion 1)	64	63.5	11.0
CONNECTICUT RIVER ESTUARY	(Subregion 2)	24.3	21.4	11.0
SOUTH CENTRAL CONNECTICUT	(Subregion 3)	76.7	110.5	29.0
GREATER BRIDGEPORT	(Subregion 4)	24.6	79.8	40.0
THE VALLEY	(Subregion 4)			
SOUTHWESTERN CONNECTICUT	(Subregion 5)	19.1	108.9	52.0
WESTCHESTER COUNTY	(Subregion 6a)		60.8	70.0
NASSAU COUNTY	(Subregion 6c)		52.5	69.0
SUFFOLK COUNTY	(Subregion 7)		81.5	63.0
SUFFOLK COUNTY	(Subregion 8,9)		6.9	33.0

1970-1990

SUBREGIONS	2,500 p/s.mi. Increment	% of Subregion Developed	SUBREGIONS	3,500 p/s.mi. Increment	% of Subregion Developed
Subregion 1	21.4	14.6	Subregion 1	15.3	13.5
Subregion 2	12.5	18.3	Subregion 2	8.9	16.3
Subregion 3	43.2	41.0	Subregion 3	30.9	37.7
Subregion 4	35.1	57.0	Subregion 4	25.0	52.0
Subregion 5	29.1	65.9	Subregion 5	20.8	61.9
Subregion 6a	1.1	71.4	Subregion 6a	0.8	71.0
Subregion 6c	12.2	85.2	Subregion 6c	8.7	80.6
Subregion 7	76.3	121.0	Subregion 7	54.5	104.0
Subregion 8,9	1.6	41.3	Subregion 8,9	1.2	39.3

SUBREGIONS	5,000 p/s.mi. Increment	% of Subregion Developed	SUBREGIONS	10,000 p/s.mi. Increment	% of Subregion Developed
Subregion 1	10.7	12.7	Subregion 1	5.3	11.8
Subregion 2	6.2	14.9	Subregion 2	3.1	13.2
Subregion 3	21.6	35.2	Subregion 3	10.8	32.3
Subregion 4	17.5	48.3	Subregion 4	8.8	44.0
Subregion 5	14.5	58.9	Subregion 5	7.3	55.4
Subregion 6a	0.6	70.8	Subregion 6a	0.3	70.5
Subregion 6c	6.1	77.1	Subregion 6c	3.1	73.2
Subregion 7	38.1	92.0	Subregion 7	19.1	77.0
Subregion 8,9	0.8	37.3	Subregion 8,9	0.4	35.4

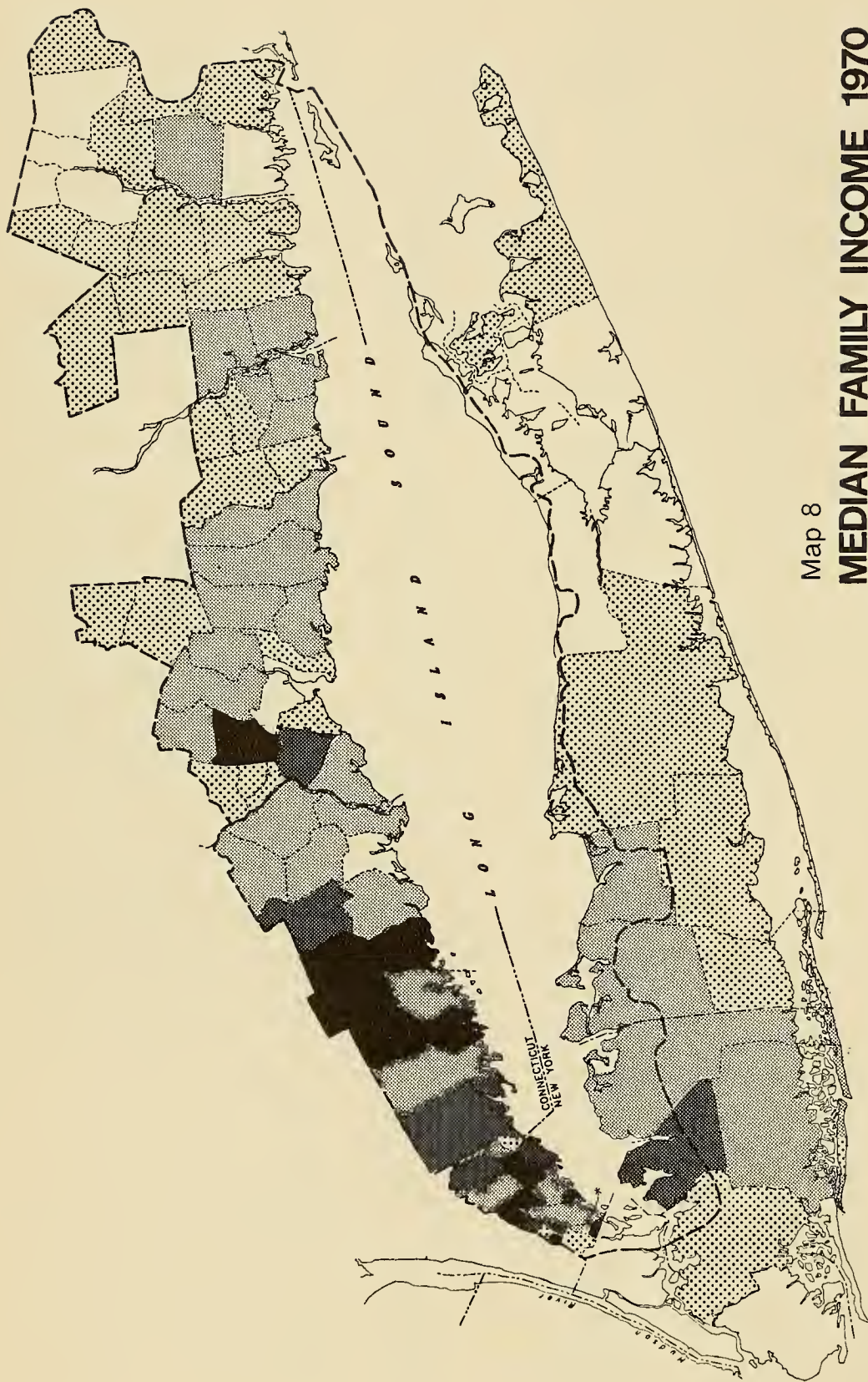
1970-2020

SUBREGIONS	2,500 p/s.mi. Increment	% of Subregion Developed	SUBREGIONS	3,500 p/s.mi. Increment	% of Subregion Developed
Subregion 1	44.9	18.6	Subregion 1	32.1	16.4
Subregion 2	23.6	24.3	Subregion 2	16.8	20.6
Subregion 3	87.6	53.8	Subregion 3	62.6	46.1
Subregion 4	63.6	71.2	Subregion 4	45.3	62.1
Subregion 5	68.6	84.7	Subregion 5	49.0	75.4
Subregion 6a	6.7	77.8	Subregion 6a	4.8	75.6
Subregion 6c	18.0	92.9	Subregion 6c	12.8	86.0
Subregion 7	168.5	192.0	Subregion 7	120.4	155.0
Subregion 8,9	3.6	50.9	Subregion 8,9	2.6	46.1

SUBREGIONS	5,000 p/s.mi. Increment	% of Subregion Developed	Subregions	10,000 p/s.mi. Increment	% of Subregion Developed
Subregion 1	22.5	14.8	Subregion 1	11.2	12.8
Subregion 2	11.8	17.9	Subregion 2	5.9	14.7
Subregion 3	43.8	41.1	Subregion 3	21.9	35.3
Subregion 4	31.7	55.4	Subregion 4	15.9	47.5
Subregion 5	34.2	68.3	Subregion 5	17.2	60.2
Subregion 6a	3.4	74.0	Subregion 6a	1.7	72.1
Subregion 6c	9.0	81.0	Subregion 6c	4.5	75.1
Subregion 7	84.2	127.0	Subregion 7	42.2	95.0
Subregion 8,9	1.8	42.2	Subregion 8,9	0.9	37.9

Source: 1970 Land Use data and OBERS population figures

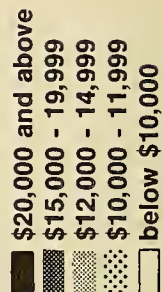
*Subregion 6b (Bronx-Queens) not included



Map 8

MEDIAN FAMILY INCOME 1970

LONG ISLAND SOUND REGIONAL STUDY



* not available

PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT

SOURCE: US CENSUS OF POPULATION, 1970
SCALE: 1 INCH = 14 MILES 1:875,000 approx.



Map 9

SEWERING

This map shows the areas that are expected to be sewerred by 1990 and 2020 on a base showing developed land. Since development tends to follow sewerred, this map indicates potential areas of future development. In the Long Island sector of the study area, it is expected that sewerred will be predominately based on package plants as development occurs.



MAP 9
SEWERING

LONG ISLAND SOUND REGIONAL STUDY

- AREAS LIKELY TO BE SEWERED BY 1990
- AREAS LIKELY TO BE SEWERED BY 2020

SOURCE REGIONAL PLANNING AGENCIES' WATER
and SEWER ENGINEERING STUDIES
SCALE 1 INCH = 8 MILES 1:500,000 approx

PREPARED FOR THE DEPT. OF HOUSING AND URBAN DEVELOPMENT
BY RALPH M. FIELD AND ASSOCIATES, WESTPORT, CONNECTICUT



APPENDIX C STATE PLANS

NEW YORK

New York State has two official plans. One stresses patterns of physical development and growth, while the other encourages sound environmental practices.

NEW YORK STATE DEVELOPMENT PLAN

In 1971, the New York State Office of Planning Coordination (now the Office of Planning Services) presented the first stage* of the state's longrange physical development plan. Published as *The New York State Development Plan - 1*, it is designed to serve as a guide for state, regional and local planning and development programs as well as for developmental initiatives by the private sector. The Plan, which assumes a population of 23 million by about 1990,** proposes state goals and objectives for (1) settlement pattern or population, (2) land use and (3) transportation.

POPULATION

The Plan anticipates that by 1990 the state's urban population will form about 90 percent of the projected 23 million total. The settlement pattern, however, would include a wide range of densities from more than 10,000 persons per square mile in central urban settings to 200 persons per square mile in sparsely settled towns at the urban fringe. This pattern should provide a wide choice of areas in which to live without sacrificing convenient access to urban services and advantages.

*Subsequent stages dealing with economic and social elements have not yet been published.

**The Plan qualified this, noting a trend to a slowing of population growth and saying that if it continued, the 23 million population level would be reached later than 1990. In this regard, the U.S. Bureau of the Census recently estimated -- the estimate is still classified as provisional -- that the State's population declined by 102,000 between July 1972 and July 1973.

LAND USE

Four land use patterns are recognized -- urban, rural, farm, and natural open space -- with different intensities of development in each. Urban development projected for 1990 would build on the existing investment in housing, business, industry and recreation and the associated transportation network required to serve those activities.

The rural land use pattern projected to 1990, while including the more limited commercial, industrial, institutional and residential uses characteristic of a settled nonfarm area, indicates a predominance of private open areas, brushland and forests.

The Plan envisages two kinds of agricultural areas: those with an exceptional combination of soil, climate, farm equipment and operator skills; and farm areas of high to moderate economic activity. The Plan proposes the retention of large farm units (farms in the state should be larger and fewer in number by 1990) "to achieve more economic management, encourage farm service industries and reduce conflicts between farm and urban use."

The Plan's objectives for natural open space use include the protection of wetlands and floodplains from urban encroachment and incompatible uses; management of state forest lands (by the Department of Environmental Conservation) geared to outdoor recreation and consistent with sound ecological practice; protection of major water bodies, shorelines; natural areas with an elevation of more than 2,000 feet and slopes of 10 percent or more; and phasing out of "low viability farmlands" for reuse.

ALTERNATIVE SETTLEMENT PATTERNS

The New York State Development Plan defines six

alternative settlement patterns, each of which occurs in the LIS study area. They are:

HIGH INTENSITY URBAN: 10,000 - 50,000 PERSONS PER SQUARE MILE. Intense, multistory commercial, industrial, institutional, residential, and transportation development; residential -- predominantly high and low-rise apartments including row housing and three, two and single-family houses; parks, playfields and urban open spaces; networks of high volume public and private transportation.

MEDIUM INTENSITY URBAN: 2,000 - 9,999 PERSONS PER SQUARE MILE. Multi and single-story commercial, industrial and residential development; mixed residential, mainly low-rise apartments, row, two and one-family detached houses with occasional high-rise apartments; and recreation and transportation facilities similar to those in high intensity urban areas.

LOW INTENSITY URBAN: 200 - 499 PERSONS PER SQUARE MILE. Mainly one-story commercial, industrial, institutional and residential development; residential--characterized by predominantly single-family detached homes with occasional two and three-family dwellings, row and low-rise apartment houses mainly concentrated in villages and hamlets; village parks and open spaces with large private open spaces in fields, brush and forests; transportation--mainly automobile with some public transportation.

EXCEPTIONAL FARMING. Areas devoted to the production of exceptional quantity, quality or particular type of farm product; wildlife habitat--characterized by higher levels of air quality and natural beauty.

NATURAL OPEN SPACE: 1,000 - 1,999 and 2,000 - 9,999 PERSONS PER SQUARE MILE.* Wetlands for wildlife habitat, flood control, air quality improvement, low intensity outdoor recreation, and natural beauty; major water bodies, existing and potential reservoir sites and their shores for water and power supply, flood control, wildlife habitat, outdoor recreation and natural beauty; and state conservation lands covering the preceding uses, and forestry.

NATURAL OPEN SPACE: 200 - 499 PERSONS PER SQUARE MILE. As above, but with the addition of slopes of 10 percent or more in areas over 2,000 feet in elevation, for control of water

runoff, wildlife habitat, air quality improvement, outdoor recreation and natural beauty.

PROPOSED PATTERN FOR LIS STUDY AREA

The New York State proposes the following land use patterns for 1990:

SUBREGION 6 (a) - WESTCHESTER

Medium intensity urban (2,000 - 9,999 persons per square mile) with natural open space along the coast; high intensity urban at Mount Vernon.

SUBREGION 6 (b) - BRONX-QUEENS

High intensity urban (10,000 - 50,000 persons per square mile) with one large state park.

SUBREGION 6 (c) - NASSAU

Medium intensity urban (2,000 - 9,000 persons per square mile) with natural open space along the coast.

SUBREGION 7 (a) - SUFFOLK COUNTY - HUNTINGTON SMITHTOWN

Medium intensity urban (2,000 - 9,999 persons per square mile) with natural open space (2,000 - 9,999 persons per square mile) along the coast.

SUBREGION 7 (b) - SUFFOLK COUNTY - BROOKHAVEN

Medium intensity urban (1,000 - 1,999 persons per square mile) with natural open space (1,000 - 1,999 persons per square mile) along the coast.

SUBREGION 8 - EASTERN LONG ISLAND

Natural open space (200 - 499 persons per square mile) along most of the coast except: low intensity urban (200 - 499) at Mattituck Creek and exceptional farming (200 - 499) west of Horton Point.

SUBREGION 9 - ORIENT POINT - RACE

Natural open space (200 - 499 persons per square mile) exceptional farming (200-499 persons per square mile) at Orient.

Table 3c summarizes the Plan as it affects the LIS study area.

*These densities reflect an attempt to encourage concentration in areas adjacent to natural open space sites.

THE ENVIRONMENTAL PLAN FOR NEW YORK STATE

The State Environmental Plan, prepared by the Department of Environmental Conservation in 1973, is aimed at encouraging sound resource management. It deals with five major resource areas: land, water, air, fish and wildlife, and energy.

LAND

The Environmental Plan treats land use as centrally important to environmental concerns since it embraces "all facets of our social and economic behavior." The Plan calls for a statewide system to protect "areas of critical concern" and "control areas" subject to development pressures, and encourages innovative site design through cluster development and PUD.

The Plan also proposes the conservation of agricultural and forest lands and the protection of valuable mineral resources.

To promote environmentally sound development and to implement land use policies, the Plan calls for such measures as:

- . Modernization of land use or development control powers
- . Restructuring of property taxes
- . Careful siting of public facilities
- . Agricultural land trusts
- . Scenic easements
- . Historic preservations

WATER

To reduce water pollution, the Environmental Plan recommends consideration of land use policies that would require assurances of adequate waste water treatment facilities before approval of new construction or new connections to existing systems. To conserve water supplies, it is proposed that the State establish criteria for helping control development over ground water aquifer and recharge areas. Regarding flood damage reduction, the Plan states that development on flood plains should be limited, and urges the eventual relocation of presently vulnerable uses.

The Plan identifies several water-related issues or concerns:

- . Protection of water supply reservoirs against inappropriate recreational uses
- . Development restrictions along lake, river and ocean shoreline
- . Providing a level of protection to lakes and shorelines comparable to that given to wild, scenic and recreational rivers.

AIR

Because of the relationship between automobile use and air pollution, recommendations are made for reducing dependence on the automobile. Location of new building complexes and activity centers so as to minimize motor vehicle use is one possibility cited. Another is the expansion of public transportation systems, and discouraging use of automobiles in center cities through limitation of parking areas. The Plan proposes to alleviate noise pollution through noise buffer zones around airports, highways and factories.

FISH AND WILDLIFE

The Plan identifies marine and coastal habitats -- particularly the Long Island wetlands -- as a special resource. A variety of techniques are proposed to protect such habitats including:

- . Land use controls of the wetlands themselves
- . Transition zones between normal high water levels and adjacent uplands and upland drainage areas
- . Regulation of underwater mining, dredging and filling (broadening of the existing Navigation Laws to include Long Island)
- . Land use controls to protect areas supporting rare, endangered species of high public interest
- . Inclusion in both public and private development plans of measures to create new habitats and improve existing habitats.

In addition, the Plan observes that more easements across private properties could be obtained to insure access to public lands and waters. It urges careful control of such public access, however, to avoid damage or destruction from excessive use.

ENERGY

Current land use patterns encourage car ownership and use, thereby contributing to the energy drain. Consequently, the Plan urges consideration of energy implications in "land use and transportation

decisions to reduce energy waste and environmental degradation." In addition, it proposes that the siting of new and replacement power generating stations "adhere strictly to all environmental and land use criteria."

CONNECTICUT

A PLAN OF CONSERVATION AND DEVELOPMENT FOR CONNECTICUT (1973), sets forth seven basic policies to conserve land and water resources. As in the New York State Plan, the state would assume the role of coordinator and arbiter of land and water use policies to assure the appropriateness of development decisions. However, neither the New York nor Connecticut plans construes this coordinating role as a substitute for planning at the local level.

A major objective of the proposed Connecticut State Plan is to increase the density of development in such a way as to protect the natural environment and to decrease the cost of providing public services.*

LAND USE CATEGORIES

The Connecticut Plan divides the state into three broad land use categories:

- . Land Suitable for Urban Development (25 percent of the total state area).
- . Land for Limited Development (50 percent).
- . Permanent Open Space (25 percent).

Urban development is defined as residential (two dwelling units or more per acre of residential land), and/or commercial, industrial and institutional development of a density requiring a "full range of urban services."

The Plan identifies areas Suitable for Urban Development but recommends that regional and local desires should govern decisions regarding density, rate and pattern of such development. Areas Suitable for Urban Development are delineated on the basis of:

- . Major concentrations of current intensive urban land uses
- . Areas serviced with existing major water and sewer service facilities

*The Connecticut Plan projects a population of approximately 4.9 million for the year 2000. It does not indicate, however, whether this is a desirable population level. The Plan proposes that the magnitude and rate of growth are decisions to be made on a local level; the Plan is concerned with the "where and how" of growth -- the issues of "when" and "how much" are not considered.

- . Areas programmed for provision of sewer service facilities to abate water pollution sources
- . Protection of high priority existing and proposed open space.

Most of the LIS coastline and the greater part of the Connecticut segment of the LIS study area are included in the Suitable for Urban Development category. Development in these areas would not pose potential water pollution problems which, according to the Plan, would limit future urban development.*

Within this broad category--Suitable for urban Development--the Connecticut Plan makes the following distinctions:

- (1) Areas are designated for expansion of urban development if they have existing, programmed and anticipated sewer systems and if the waste tolerance level of recipient streams is greater than the design capacity of sewer systems.
- (2) Areas are designated for additional long-range expansion of urban development if they are not served or currently projected to be served by sewer systems but are within areas delineated as Suitable for Urban Development. Such areas might be developed, with the installation of public water and sewer systems, once contiguous areas of Type I (above) have reached maximum growth.

Relative to the LIS study area, the Connecticut Plan shows areas with opportunities for expansion of urban development along the previously developed coastal strip, while additional long-range expansion is shown to take place inland and near those areas.

The Connecticut Plan identifies Limited Development areas on the basis of:

- . Watersheds tributary to existing and potential water supply watersheds
- . Major agricultural areas
- . Areas neither readily suited for urban development nor presently identified as critical open space.

The Permanent Open Space category is defined primarily in terms of existing and potential uses and attributes such as:

- . Public and quasi-public open space and recreation

* An exception occurs in Subregion 1 in the town of East Lyme.

lands

- Water utility owned lands
- Major coastal and inland wetlands
- Unique and scenic natural features
- Water Impoundment sites
- Major recreation areas
- Major underground water supply sources
- Land designated in Regional Planning Agency proposals for open space and recreation in urban areas.

LAND USE POLICY RECOMMENDATIONS

The Connecticut State Plan's policy recommendations affecting land use embrace both conservation and development, and may be summarized as follows:

- Since intensive urban development is incompatible with high level of water quality, watersheds tributary to water supply reservoirs should be protected from intensive development.
- More recreational areas are needed to "provide a wide variety of high-quality outdoor recreational opportunities to all citizens." Acquisition or redevelopment of sites in or near major population centers should have top priority.
- Development in watersheds draining into recreational water bodies and along shorelines should be limited to preserve water bodies from pollution.
- The amount of shoreline open to the public and public access to saltwater swimming, fishing and boating should be increased through the expansion of existing facilities and development of new ones.
- It is essential to protect scenic, historic and natural resources of the state "from premature, uncontrolled or incompatible development," and maintain agricultural and forest areas in their present use. Reinforcement of the trend to multi-family housing could assist such efforts by conserving land.
- In general, rivers, lakeshores, floodplains and coastline require protection "from environmentally destructive alterations and development." Long Island Sound, in particular, should be protected through review of the environmental implications of any plan requiring "filling of, construction over or adjacent to, the Long Island Sound."

- Stream channel encroachment lines and floodplain zoning laws should be more widely used to prohibit building on floodplains. The Inland Wetlands Act (1972) protecting wetlands that can store flood waters should help prevent flood damage, but additional land use measures are needed to "minimize surface water runoff in watershed tributaries in seriously flood-prone areas."

- The basic tools for directing urban development should be the timing and placement of water and sewer lines and concentration of state and federal aid programs in areas delineated as Suitable for Urban Development.

- All actions undertaken should reverse the deterioration of the urban environment (particularly in the central cities) and guard against haphazard urban development in rural areas.

- Limited Development Areas should be devoted to a use and density level ensuring indefinite functioning of in-lot water supply and waste disposal systems.
- Urban development should occur at densities necessary to ensure economic provision of services. Public sewer and water should be provided in all development areas where needed, in accordance with desired patterns of development.
- "Larger scale, innovative private development projects...providing opportunity for greater variety and choice of lifestyle and economy in the provision of public services" should be encouraged, particularly in areas delineated as Suitable for Urban Development, and close to existing transportation, employment and shopping facilities.

"Plan for Conservation and Development: Policies for Land and Water Resources" was implemented by Governor Meskill by Executive Order 28 on September 27, 1974 and is now the official Connecticut plan.

REGIONAL PLANNING

The major land use policies of the regional planning agencies are summarized in the following chart.

TABLE 1c

RPA LAND USE PLANS: SUMMARY OF POLICIES AND PROPOSALS

TOPICS	SOUTHEASTERN CONNECTICUT (Subregion 1)	SOUTHCENTRAL CONNECTICUT (Subregion 3)	GREATER BRIDGEPORT (Subregion 4)	VALLEY (Subregion 4)
DEVELOPMENT PATTERNS	Continued centralization of residential and nonresidential uses in New London, Groton, Norwich.	Logical development in existing corridors; expansion of nonresidential activities north from New Haven in Quinnipiac River Valley.	Bridgeport as a strong nonresidential core, surrounded by medium density development; arms of higher density out along freeway.	Restrict population growth and develop Rt. 8 corridor.
ENVIRONMENTAL ASPECTS	Recommends potential reservoir sites and preservation of tidal marshes.	Natural land and water characteristics to determine land use; upland areas withheld from development.	Water quality stressed, elimination of combined sewers urged.	Asks substantial improvement and future judicious use of natural environment; flooding a major problem.
RESIDENTIAL ASPECTS	Proposes future scattered residential development at 3 or more acres per DU and six new village sites.	New forms of residential development to balance environmental and service needs.	Higher density recommended near centers.	Recommends cluster and PUD forms, limiting high densities to river area and/or open space; coordination with waste disposal.
NONRESIDENTIAL ASPECTS	Extensive industrial area at Waterford; industrial areas to be closely related to major needs.	Renewal of older centers, chiefly New Haven; new economic activities to the corridor above New Haven.	Need for economic revival and accommodation of new job producing facilities.	Recommends Ansonia-Derby-Shelton complex as center for commercial and civic office growth, higher employment levels.
LEISURE ASPECTS	Proposes addition to Bluff Island State Park in Groton.	Extensive open space/recreation system proposed; new zoning techniques, governmental and nongovernmental reservation of open space.	Open space along LIS shore, rivers and Rt. 25.	River as a potential leisure asset; use of surplus water supply reserves for recreation.
TRANSPORTATION ASPECTS	New bridge across Thames River at New London foreseen.	New facilities urged at New Haven port; asks LIS bridge not be sited at New Haven.	Recommends additional lanes on Conn. Tpke. and Merritt Parkway, improvement and development of Bridgeport harbor and airport.	Increase in use of public transportation recommended.
COASTAL AREAS	Excepting existing recreation areas and proposed wetland reservation, shore line as residential.	Expand public access to shore areas.	Increased recreation use of the coast urged.	Lower Housatonic River as linear focus for residential and recreation use.

TABLE 2c

RPA LAND USE PLANS: SUMMARY OF POLICIES AND PROPOSALS

TOPICS	SOUTHWESTERN CONNECTICUT (Subregion 5)	WESTCHESTER (Subregion 6a)	THE BRONX-QUEENS (Subregion 6b)	NASSAU-SUFFOLK (Subregions 6c, 7, 8 & 9)
DEVELOPMENT PATTERNS	Clustering and centralizing of development; interruption of strip development by open space and low density.	Medium density and open space uses for inland and shore areas, adjacent to higher density sectors.	Not Available	Centers along freeways and rail lines with medium density clusters related to them; lower density near shore.
ENVIRONMENTAL ASPECTS	All wetlands to be guarded; uses allocated within limitations of natural land and water environment.	Existing natural environment to shape and control future urban growth.	Not Available	Preservation of wetlands and farmlands of North Shore.
RESIDENTIAL ASPECTS	Cluster and PUD concepts recommended; relatively high density at existing concentrations.	Recommends medium density, higher densities limited to highway-rail corridor.	Any new housing in Queens along shore to bridge old upland and sea.	Recommends higher density development near centers and transport nodes; residential clustering and PUD.
NONRESIDENTIAL ASPECTS	Two principal urban cores: Stamford and Norwalk.	Proposes one major urban center (New Rochelle), four intermediate (Larchmont, Mamaroneck, Port Chester, Rye), one local (Harrison).	Major emphasis on development of Manhattan as national center; industrial redevelopment of East River Band; secondary employment-service centers in outer boroughs.	Industrial-commercial development to be clustered near major transportation corridors.
LEISURE ASPECTS	Offshore islands, marshes and vacant shoreline areas for recreation; lower Mianus riverway for recreation open space.	Open space recommended for LIS shore.	Fort Totten ultimately to be used as park; parts of Bronx east of Throgs Neck Bridge proposed for recreation uses.	Recommends open space in all its forms; continuation of park acquisition program.
TRANSPORTATION ASPECTS	Recommends one railroad transfer center; opposes expansion or new construction of expressways.	Intermodal transfer terminal recommended for New Rochelle.	Not Available	Recommends new North Shore expressway, Oyster Bay bridge, expansion of Port Jefferson harbor and Greenport, new mass transit.
COASTAL AREAS	Increase in recreation utilization emphasized.	Recommended for recreation open space.	Not Available	Renewal of harbor fronts; open space as major use for shore areas.

Note: A regional plan is currently being developed by the Connecticut River Estuary Regional Planning Agency.

TABLE 3c

NEW YORK STATE DEVELOPMENT PLAN AS IT AFFECTS LIS STUDY AREA*

DEVELOPMENT MAP	SUBREGION 6	SUBREGION 7	SUBREGION 8	SUBREGION 9
SETTLEMENT PATTERN**	(a) Westchester 2,000 - 9,999 psm***	(a) Huntington-Smith- town Suffolk County line east to the Smithtown eastern town line 2,000 - 9,999 psm	200 - 499 psm	200 - 499 psm
	(b) Bronx-Queens 10,000 - 50,000 psm	(b) Brookhaven from Smithtown eastern township to end of subregion 1,000 - 9,999 psm		
	(c) Nassau County 2,000 - 9,000 psm			
FARMING LAND USE DESIGN	None	Small area in Brookhaven	All subregion	Most of subregion excluding Plum, and Fisher's Islands
OPEN SPACE LAND USE DESIGN	None	Entire coast east of Smith- town	Entire coast	All subregion
URBAN LAND USE DESIGN	(a) Medium intensity (b) High intensity (c) Medium intensity	Medium intensity	Low intensity	Low intensity
TRANSPORTATION CORRIDORS	Corridor around I-95 and 287	Corridor outside the subregions around I-495		

* Based on interpretation of physical development maps contained in Plan report.

** Density patterns were determined for towns and cities as units; actual densities may vary widely inside localities.

*** Persons per square mile (average).

APPENDIX D EVALUATION MATRIX

DETAILED EVALUATION OF ALTERNATIVE MEASURES

a. SOURCES

The 54 criteria listed in the left column are a synthesis of guidance obtained from many sources. Most notable among these are:

- The Principles and Standards (PAS) of the U.S. Water Resources Council
- Various guidelines for the preparation of environmental impact statements (EIS) required under the National Environmental Policy Act of 1969 (NEPA). The EIS requirements were also incorporated by the WRC in its formulation of the PAS.
- The Coastal Zone Management Act of 1972.
- The LIS Plan of Study.
- Guidance from the New England River Basins Commission.
- Concepts developed by study participants.

By far the most significant of these sources was the PAS. For example, the criteria used in the matrix have been grouped so as to correspond with the four "accounts" required by the PAS. The environmental criteria correspond to the environmental quality (EQ) account. The economic criteria correspond to two accounts--national economic development (NED) and regional development (RD). The social criteria correspond to the account on social well-being.

b. ALTERNATIVE MEASURES

The 34 alternative measures heading each column on the horizontal axis of the matrix are explained in chapter 6 of this report. These measures focus on protecting the supply of resource areas, reducing development pressures on those areas and increasing access to the amenities of the study area. Applied in combinations, they form a policy system to guide future development.

c. ENTRIES IN THE MATRIX

Unless otherwise indicated, entries in the evaluation matrix reflect judgments as to the most likely, overall, long-term and widespread effects of implementing a specified measure (a column) on a specified criterion (a row)--as perceived from the egocentric view of the evaluator. Most entries in the matrix are portrayed by the following symbols:

+ significantly benefit

+ significantly beneficial

++ outstandingly beneficial

— significantly adverse

= severely adverse

o not applicable, or benefits and adversities are generally minor.

EVALUATION MATRIX OF LAND USE MEASURES

THE SUMMARY RATING ENTRIES ARE :

GOOD	BENEFICIAL ENTRIES EXCEED ADVERSE ENTRIES
FAIR	BENEFICIAL AND ADVERSE ENTRIES BALANCE
POOR	ADVERSE ENTRIES EXCEED BENEFICIAL ENTRIES

MAXIMIZE AMENITIES

FOOTNOTES	PREVENT ENCODING OF INAPPROPRIATE DEVELOPMENT			FACILITATE AND ENCOURAGE BEST USE		DIRECT LOCATION OF URBAN DEVELOPMENT	REDUCE URBAN LAND DEMAND		INCREASE OPPORTUNITY FOR ACCESS TO AMENITIES			
	APPLY PROTECTIVE REGULATIONS	REDUCE RURAL LANDOWNERS' LOSSES	NON-REGULATORY RESTRICTIONS	REDUCE PRIVATE COSTS OF BEST USE	INCREASE PRIVATE PROFIT	LAND PURCHASE	APPLY DEVELOPMENT REGULATIONS	PUBLIC FACILITIES INFLUENCE	NO GROWTH	INCREASE DENSITY OF URBAN DEVELOPMENT	FACILITATE LEGAL ACCESS	INCREASE AMENITY SUPPLY
ZONING, EASEMENTS AND OTHER CONCRETE/REGULATORY REGULATIONS WETLANDS RESTRICTIONS FLOODPLAIN RESTRICTIONS OTHER SPECIAL PURPOSE RESTRICTIONS	EDUCATION AND PUBLICITY CASH COMPENSATION CLUSTER PRINCIPLE: ONE ACRELOT (POD) CLUSTER PRINCIPLE: DENSITY TRANSFER SEMI-CLUSTER PRINCIPLE: DENSITY TRANSFER SEMI-CLUSTER PRINCIPLE: DENSITY TRANSFER FLOOD INSURANCE REQUIREMENTS	TEMPORARY TAX REDUCTIONS FOR AGRICULTURAL USE PERMANENT TAX REDUCTIONS FOR AGRICULTURAL USE TEMPORARY TAX REDUCTIONS FOR OTHER SPECIAL OCCUPANCY AGENCIES PERMANENT TAX REDUCTIONS FOR OTHER SPECIAL OCCUPANCY AGENCIES DIRECT INTERVENTION THROUGH LOANS - SUBSIDIES EMULSION OR PROTECT PRIVATE MARKET	FOR FUTURE ACTIVITIES REQUIRING PUBLIC ACCESS (e.g. RECREATION) FOR FUTURE ACTIVITIES REQUIRING PARTICULAR SITES	ADVANCE DESIGNATION OF RIGHT LOCATIONS FOR DEVELOPMENT NEPA-TYPE CONSIDERATION OF ALTERNATIVE SITES TRANSFORMATION SEMI-CLUSTER	DEVELOP INTO EXISTING FACILITIES PRESENT POPULATION GROWTH REGULATIONS: ELIMINATE LOW DENSITY REQUIREMENTS AND ESTABLISH MINIMUM DENSITY REQUIREMENTS LEGAL AND ECONOMIC: BETTER URBAN DESIGN AND MANAGEMENT CONCENTRATION: TO URBAN SCALE - MODERN AND HIGH DENSITY DEVELOPMENT - FINANCING - LAND ASSEMBLY DIRECT ASSISTANCE TO HIGH-INTENSITY TRANSPORTATION	CONSTITUTIONAL AND STATUTORY CHALLENGES TO RESTRICTIONS LOCAL LEGISLATIVE ACTION STATE OR FEDERAL LEGISLATIVE ACTION STATE AGENCIES: NON-PRIVATE DEVELOP AREAS: AGENCY PUBLIC	FACILITATE PHYSICAL ACCESS: TRANSPORTATION					

[illegible]

FOOTNOTES

1. "Environmental criteria are described in terms of beneficial effects. Adverse effects should be read as the converse of each statement."
2. "Natural beauty benefits result from the protection, or enhancement... of open and green space, wild and scenic rivers, lakes, beaches, shores, mountain and wilderness areas, estuaries, or other areas of natural beauty."
3. "Water and air quality benefits are reductions in the contaminants in the water and the air without regard (on this row) for the effects of these reductions on other criteria."
4. "Benefits to an ecological system reflect broad judgments as to the most likely overall longterm and widespread effects on the system under consideration. For example, an entry of "+" opposite warm water resident aquatic animals (e.g. pickerel) means that (1) considering the overall consequences (in land, water and air quality; habitat; human uses; etc.), (2) the net effects (benefits less adversities) will probably be beneficial (a) over the long term (once the immediate effects fade away), and (b) over all or most of the watershed. Many ecologists would understandably caution against making judgments as to net effects. They would prefer to estimate only the impacts listed elsewhere in the table (e.g. improved water quality, decreased human activities). They would refrain from estimating the effects of these impacts on any biological system as being beyond the current state of the art or as apt to mislead. To reinforce their point, they would explain for example, that what would probably be "beneficial" to one warm water species might be adverse to another. Even for the same species, they could point out that an apparently beneficial change (e.g. in deer habitat) could produce overpopulation and eventual mass starvation without management (e.g. periodic timing of the herds). Agreeing with these comments, we nevertheless have chosen to estimate net effects. To suspend judgments on the effects, however scientifically defensible, is not useful to those who must conscientiously weigh all major considerations before making decisions. Decisions to act or not to act cannot be avoided. They must be made using best available judgments on effects."
5. "Archeological-historical benefits are highly site specific, with early recognition, projects and programs can usually be adjusted to preserve these values."
6. "Bibliographical benefits here are increased opportunities to observe rare and endangered species and the ecological systems upon which they depend with the end of significantly enlarging understanding and appreciation of the natural world as the habitat of man. All programs that would involve any significant construction, inundation or change in land use patterns are rated significantly adverse. This rating is based upon the general expectation that given enough study, almost every area of any size will be discovered to have one or more scarce biological species, or be able to be described as a unique locale for studying one or more such species."
7. "Geological benefits are the preservation of outstanding geologic or geomorphologic significance so as to contribute to man's knowledge and appreciation of his physical environment. Although individual projects and program applications could produce significant effects, in general the effects in the LIS Region are probably minor."
8. "Irreversible commitments was the most difficult criterion to evaluate with consistency. Many early concepts of irreversibility almost compelled inaction. If an action could be labeled irreversible or possibly irreversible, the uniform conclusion was -- do not act until 100 percent sure of all effects. Little attention was given to the possibility of irreversible effects stemming from inaction. The definition in the PAS requires a more sophisticated evaluation because it incorporated this concomitant responsibility for the effects of inaction. According to the PAS, beneficial effects are those resulting from the preservation of freedom of choice to future resource users by actions that minimize or avoid irreversible or irretrievable effects, or, conversely, the adverse effects resulting from failure to take such actions, (underscoring added). Another major difficulty is the use of the concept of irreversibility without adequate definition of its range in space and time. Almost every physical action causes irreversible environmental effects at some level (e.g. a house foundation with respect to the forest floor it replaces.) If weighed in a broader setting, however, (e.g. 10 house foundations in a 100 square mile valley), the environmental effects

- on the valley may not be at all irreversible. Even when weighed over the longterm and over a widespread area, irreversibility is hard to categorize. A flood control dam, for example, could (if later knowledge indicated the wisdom) be used to cause (as well as minimize) large floods, wetlands formation or instable stream conditions. In this sense, the major widespread longterm effects of the dam could readily be reversed even though the localized effects at the dam site and its impoundment area would indeed be irreversible. Similarly, a land use measure that diverted concentrated development away from the river-adjacent heart of cities into suburban or rural areas would indeed produce an irreversible effect: the development thus diverted -- and the infrastructure of new roads and utilities that must be built to serve it -- will rarely move back. On the other hand, if such a land use policy were to be reversed, it is probable that future development would in time be forced to reverse the previously induced dispersion trends. With these thoughts in mind, all entries under this criterion are labeled "o". Those who prefer a different entry should define the setting in which their evaluation is formulated."
9. "Summary rating for environmental, ecological and social criteria are expressed as GOOD, FAIR and POOR depending upon the preponderance of other relevant entries in the table. It should be noted that almost every GOOD (POOR) summary rating was awarded despite one or a few adverse (beneficial) entries. Rarely is any situation all good or bad."
 10. "Broadly considered, the ratings under economic criteria are essentially identical whether judged from the point of view of NED (one of the two overall objectives of the LISS Study) or RD. This follows because of the premise that in the LIS Study national and regional objectives are in general harmony. The study, for example, does not attempt to induce manufacturing to locate here in preference to a more economically efficient location elsewhere nor does it seek favored treatment vis-a-vis other regions in the allocation of national resources. Therefore, entries here generally apply equally to the accounts for national economic development and regional development."
 11. "Any alternative by which needs are fulfilled or partially fulfilled, will be beneficial in terms of life, health & safety." (Mineral Resources and Mining Planning Report.)
 12. "Listed here are the subjects addressed in the 10 LISS planning reports; one has been subdivided into water quality and water supply. An entry reflects a judgment as to whether the net effects of an alternative program will complement (+) or conflict (-) with the listed planning report."
 13. Transportation is being considered only within the limits of the definition by the transportation workgroup (non-land oriented). However, the measures being evaluated are all land oriented and are highly influenced by land transportation measures.
 14. "A "o" rating reflects the judgment that implementation of the program will require insignificant judicial involvement. A "=" indicates severe judicial problems."
 15. This does not assume any estimate of effectiveness.
 16. There will usually be a need for some level of federal action either directly through public investments or indirectly through incentives.
 17. "If a new institution (new law or new authorization) is not required or, if required, would present little difficulty, "o" is entered. A rating of "=" indicates that a new institution (new law or new authorization) would be required and its creation (passage) would present probably difficulties."
 18. It is assumed that environmental attractiveness is an appearance criterion (visual amenity).
 19. "Hardly any project or program can be classified as completely oriented toward EQ or toward NED. Furthermore, almost every alternative can be adapted to minimize its adverse effects on an apparently incompatible objective. For the purpose of subsequent plan formulation, however, some meaningful categorization is very desirable here. Five entries were used to reflect this categorization :
- | | |
|-----------|---|
| Only EQ | - important for EQ reasons, despite significant economic objections |
| Pref. EQ | - preferable for EQ reasons, no significant economic objections or preferences. |
| Pref. NED | - preferable for NED reasons, no significant environmental objections or preferences. |

- Only NED - important for NED reasons, despite significant environmental objections.
- Only SW - not particularly desirable or objectionable for environmental or economic reasons, preferable only for reasons of social well being.
- All - compatible to all objectives
- None - compatible to none of the objectives

NOTE: All quoted footnotes (except when indicated) are from: *Flood Damage Reduction*, a model plan report.

COMMENTS

1. This approach to analysis is highly subjective, varying by individual knowledge and

interpretation. It is misleading to isolate measures for evaluation. The individual measures do not necessarily add up to a whole program. The interdependency among measures is the key to a desirable program. For example, clustering alone as a measure would not rate well environmentally or socially unless supported by other measures to direct the location of development, and programs involving this concept (clustering) would never be administered in and of themselves anyway.

2. Preventing population growth as a measure alone does not assure any positive benefits to the environment, economy, or society. (If zero growth were accomplished immediately, the present population would continue to increase consumption of resources unless other measures were taken).
3. Transportation costs are relative. Assuming transportation will be assisted, then high intensity transportation cost (Rapid Rail) should be measured against less efficient means of transportation costs (Federal Highway Program) – direct and indirect.

